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CUTBACKS IN MEDICAID ELIGIBILITY UNDER THE OMNIBUS BUDGET RECONCILIATION ACT OF 1981: IMPLICATIONS FOR ACCESS TO HEALTH CARE SERVICES AMONG THE NEWLY INELIGIBLE

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Department of Health and Human Services
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PREFACE

The Medicaid program, which finances health care for over 20 million needy Americans, has undergone major changes in the 1980s. Besides federally mandated restrictions on AFDC eligibility for some working poor -- which also meant loss of Medicaid benefits -- and limitations on federal financial participation for the years 1982-84, the Omnibus Budget Reconciliation Act of 1981 (OBRA) and subsequent legislation have given the states more flexibility to change basic program parameters, including which groups of people are served, what services are provided, how doctors, hospitals, and nursing homes are paid, and how care can be organized in innovative ways.

The Medicaid Program Evaluation (MPE) addresses the implementation and impact of selected changes in the Medicaid program to provide knowledge for policy assessment and future legislative change. It is focused on selected issues and policy questions raised by recent legislation:

- Federal Financial Participation
- Inpatient Hospital Reimbursement
- Eligibility
- Case Management
- Home and Community-Based Waiver Program
- Cost-Sharing
- Financial DRG Effects on Medicaid and
- Synthesis.

Together these studies are intended to describe how recent changes have been implemented, and analyze what their effects have been for program services and costs.

Under OBRA 1981, several states obtained freedom-of-choice waivers in order to implement Medicaid primary care case management initiatives. The adoption, implementation, and impact of these case management initiatives are the subject of six MPE Task 4 Working Papers. Working Paper 4.1 is a survey of all state activity -- in case management and other areas -- in response to OBRA's relaxation of the Medicaid freedom-of-choice requirement. Working Papers 4.2 and 4.3 are in-depth case studies of early primary care case management programs adopted by Michigan and Utah, respectively, and 4.4 contains briefer descriptions of

case management initiatives in four other states, Kansas, Colorado, Nevada and Wisconsin. Finally, this paper provides a synthesis of findings from all the Task 4 case studies. Working Paper 4.6 contains the results of an econometric analysis of Utah Medicaid claims data to assess the impact of case management on utilization and expenditures.

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The authors are indebted to several members of their staff at Syracuse University. Judy Ball tirelessly contributed by making a near-endless succession of computer runs that led to the final utilization equations. Moreover, Judy made important substantive contributions to data file construction, including measures for family structure, pregnancy, and health insurance coverage. Brenda Spillman contributed significantly to much of the remaining computing, including the utilization predictions and numerous runs for final fact-checking. Jay Crozier and Mark Miller were responsible for initial National Medical Care Utilization and Expenditure Survey (NMCUES) file construction from the public use tapes and Area Resources File data, as well as all of the Current Population Survey tabulations measuring characteristics of the Medicaid population. Pat Davitt provided research assistance at various points in the study, including preparation of the text figures. Martha Grandinetti skillfully typed the manuscript and appendix tables. They are a good crew and they deserve our sincere thanks.

Several other individuals and organizations also warrant thanks for their contributions. We are especially grateful to Barbara Mosher and G.G. Frick of Research Triangle Institute (RTI) for their cooperation in providing documentation and answering our numerous technical questions about the NMCUES data and their appropriate use. The following participated in providing the numerous special NMCUES files for our use: Bob Wright of the National Center for Health Statistics, Herb Silverman and Gerry Adler of the Health Care Financing Administration, and Barbara Mosher and G.G. Frick of RTI. The Current Population Survey data utilized in this report were made available by the Inter-University Consortium for Political and Social Research. The data were originally collected by the Bureau of the Census. Neither the original source or collectors of the data nor the Consortium bear any responsibility for the analyses or interpretations presented here.

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EXECUTIVE SUMMARY

When Congress passed the Omnibus Budget Reconciliation Act of 1981 (OBRA), the view that the social welfare system in the United States had become much too expansive and generous was accepted as the official position of the federal government. This shift in national welfare policy resulted in a variety of changes, limitations, and cutbacks in the federal-state cash assistance program, Aid to Families with Dependent Children (AFDC). Recent studies have found that 1 to 2 million persons were dropped from the AFDC rolls as a result of this legislation. AFDC eligibility assures eligibility for Medicaid, so these OBRA-related cuts in AFDC enrollments have implications for the health insurance coverage status of those dropped from the cash assistance rolls (that is, the newly ineligible). More importantly, as there is a direct relationship between the extent of health insurance coverage and the rate of use of health services, these cutbacks have implications for the accessibility of health services to the newly ineligible subpopulation.

In this study, the impact of these OBRA-related cutbacks on the use of health care services among the newly ineligible subpopulation is assessed quantitatively. The services examined include ambulatory physician services, inpatient hospital services, prescription drugs, dental services, and vision-related services.

The data for the study come primarily from two sources: 1) the 1980 National Medical Care Utilization and Expenditure Survey (NMCUES), and 2) the March 1982 Current Population Survey (CPS). NMCUES provides detailed information on health services utilization and expenditures,

health insurance coverage, health status, and demographic and socioeconomic characteristics of the civilian, noninstitutionalized population of the United States. For this study NMCUES provided 2,038 observations on both Medicaid enrollees and similarly situated low-income nonenrollees. These data were used to estimate utilization equations, designed mainly to isolate and quantify the effect of various forms of health insurance coverage--specifically, Medicaid, private coverage, and self-insurance--on health services utilization.

The CPS is a stratified probability sample of the civilian noninstitutionalized U.S. population. Aside from the decennial census, it represents the most comprehensive and reliable source of general demographic and economic information on the U.S. population. These data provided estimates of the demographic and economic characteristics of the newly ineligible subpopulation. By combining these data on the characteristics with the estimates of the utilization equations, it was possible to develop predictions of OBRA's impact on health services utilization among the newly ineligible subpopulation.

The principal findings of this study--which are illustrated in six histograms accompanying the written text--can be summarized as follows:

- Those newly ineligibles successful in replacing Medicaid with private health insurance--about 55 percent of the newly ineligible population--experienced an insignificant decline in their use of ambulatory physician services, inpatient hospital services, and prescription drugs.

- In contrast, the remaining 45 percent of the newly ineligibles failing to acquire significant coverage experienced large, statistically significant declines in their use of basic health services.
- Specifically, among those acquiring no alternative coverage, the OBRA-induced loss of Medicaid eligibility appears to have lowered the use of physician services by 38 percent, the use of inpatient hospital services by 71 percent, and purchases of prescription drugs by 39 percent.
- Loss of Medicaid coverage for dental services implies a 61 percent reduction in the use of those services; this conclusion applies to approximately 92 percent of those losing Medicaid dental coverage, as only about 8 percent would have obtained replacement private dental insurance.
- While the findings pertaining to the use of vision services seem roughly consistent with the foregoing conclusions, the estimates were too imprecise to actually yield statistically significant results.

The report closes with suggestions for further research. The two research questions with the greatest relevance to health policymakers are:

- How much did the OBRA-induced reductions in Medicaid enrollments actually lower Medicaid program costs? The answer to this question is not transparent, since utilization patterns for the newly ineligibles differ from the average AFDC/Medicaid utilization patterns.

- To what extent did the OBRA-induced loss of Medicaid eligibility cause a change in the places where the newly ineligibles sought ambulatory physician care (e.g., shifting from a doctor's office to a neighborhood health center or perhaps to the emergency room of a public hospital)? Further work on issues such as this one may shed useful light on some aspects of the quality of care received by the newly ineligibles.

Introduction

When Congress passed the Omnibus Budget Reconciliation Act of 1981 (OBRA), the view that the social welfare system in the United States had become much too expansive and generous was accepted as the official position of the federal government. This shift in national welfare policy resulted in a variety of changes, limitations, and cutbacks in the federal-state cash assistance program, Aid to Families with Dependent Children (AFDC). The purpose of these alterations was to ensure two things: 1) that the "truly needy" continued to benefit from the social safety net provided by AFDC cash assistance payments, while 2) those capable of supporting themselves were removed from the AFDC rolls, thereby breaking their dependency on public support. Accordingly, the OBRA cuts in AFDC were targeted principally on working poor and near-poor welfare families. Recent studies of the impact of OBRA have found that this legislation was highly effective, reducing the AFDC rolls by as much as 8 to 16 percent, or 1- to 2-million people (Cromwell et al., 1984; General Accounting Office, 1984).

Eligibility for AFDC cash assistance assures eligibility for Medicaid (with the exception of those AFDC recipients residing in Arizona, which had no Medicaid program during this period). In fact, about 65 percent of all Medicaid recipients gain eligibility through their eligibility for AFDC (Sawyer et al., 1983). Accordingly, the OBRA-related cuts in AFDC enrollments carried implications for the

health-insurance coverage status of those dropped from the cash-assistance rolls (that is, the newly ineligible).

There are two possible outcomes. First, some of the newly ineligible families presumably acquired some form of private health insurance coverage. Generally, such private coverage would be employment-based, since most low-income families surely find the cost of privately acquired health insurance prohibitive. Of course, in some instances private policies cover only part of a family, whereas Medicaid coverage may have extended to the entire family. Moreover, private health insurance policies typically offer less comprehensive coverage than Medicaid. The second outcome is that some newly ineligible families presumably went without health insurance coverage. Recent estimates reported in Long and Settle (1984) suggest that about one-half of the newly ineligible families obtained some form of private health insurance coverage, and about one-half went without coverage.

Since there is a direct relationship between the extent of health insurance coverage and the rate of use of health services, the OBRA-related cutbacks in AFDC enrollments have implications not only for the cash incomes of the newly ineligible families, but also for the accessibility of health services to these families. In the present study, the impact of these OBRA-related cutbacks on the use of health care services among the newly ineligible subpopulation is assessed quantitatively. The services examined include ambulatory physician services, inpatient hospital services, prescription drugs, dental services, and vision-related services.

The study is organized in the following way. First, the data and empirical methods are described. Next, the quantitative findings are presented. Suggestions for further research are offered in the final section.

Methods and Data

In this section of the paper, a number of important conceptual and technical issues are considered. The conceptual question of the proper research design for this study is addressed first. Next, the more technical problem of predicting individual or group utilization rates, for some given set of individual or group characteristics, is discussed. Third, an approach to estimating the appropriate values for characteristics of the group rendered ineligible for Medicaid by OBRA is developed. Various data issues are taken up, wherever appropriate, in these three subsections, but especially in the last two.

Research Design

The objective of this study is to assess quantitatively the extent to which members of the subpopulation rendered ineligible for Medicaid by OBRA experienced reductions in their use of health-care services. Other studies have explored the issue of how many persons were affected by OBRA, either by being dropped from the Medicaid rolls or through being prevented from coming onto the Medicaid rolls. (In referring to the aggregate of these two groups--that is, those explicitly dropped from the rolls and those kept from coming onto the rolls--this study often employs the phrase "newly ineligibles" for expository convenience.) As noted above, the General Accounting Office (1984) found that the Medicaid rolls included about 1 million fewer persons as a direct consequence of OBRA; Cromwell et al. (1984) puts the estimate at close to 2 million persons.

The present study does not reconsider this specific issue. Rather, the approach adopted here accepts these estimate of aggregate impacts and proceeds to assess the extent to which utilization rates--measured in terms of use rates per 1,000 newly ineligible persons--changed as a result of OBRA. Of course, estimates of the aggregate utilization consequences of OBRA could easily be derived by combining the previous estimates of OBRA's influence on aggregate enrollments with the estimates of use-rate implications per 1,000 newly ineligible persons.

Under ideal circumstances, an evaluation such as the one proposed here would proceed in accordance with an experimental research design, involving random assignment of certain Medicaid enrollees to control and treatment groups. The control and treatment groups would be designed to represent the subpopulation of persons losing Medicaid coverage as a consequence of OBRA. If such an idealized study had been undertaken prior to the implementation of OBRA, the individuals assigned to the control group would retain their Medicaid eligibility during the experimental period (unless that status was lost for reasons unrelated to OBRA), while the persons assigned to the treatment group would lose their Medicaid coverage, just as they would have under OBRA. In contrast, had such an experiment been conducted subsequent to the passage of OBRA, the control group would comprise a sample of randomly-selected newly ineligible persons, whereas the treatment group would retain their Medicaid status for the duration of the experiment (again, unless it was lost for reasons unrelated to OBRA).

Had either of these research strategies been followed, relatively simple comparisons of group utilization rates (expressed, for example, in

rates per 1,000 persons) would have yielded reliable estimates of OBRA's impact on the use of health services among the newly ineligible. However, neither form of social experimentation was conducted. So, there are simply no data available for pursuing this ideal approach to assessing OBRA's implications for access to health-care services among the newly ineligible subpopulation.

When an experimental design cannot be employed, the preferred alternative is a quasi-experimental design (Campbell and Stanley, 1963). For present purposes, such a design would involve the following. Two samples would be established: 1) a treatment sample drawn from the subpopulation of newly ineligible persons, and 2) a control sample selected from among those Medicaid enrollees whose eligibility was not affected by OBRA. In principle, the treatment sample should be drawn randomly from the universe of newly ineligible persons. In contrast, the control group would probably not be drawn randomly from among those retaining Medicaid eligibility. Under ideal circumstances, the control group would be identical to the treatment group, except for differences in Medicaid eligibility. This consideration would likely require some form of nonrandom selection in establishing the control sample. By way of illustration of this point, since OBRA was targeted on AFDC/Medicaid families with substantial earned income, the control sample should presumably be selected largely from among those Medicaid families with some earned income, but not enough to result in loss of eligibility for Medicaid.

Once these quasi-experimental samples are established, the next step would involve collecting information on health services utilization and other relevant characteristics for both the pre-OBRA and post-OBRA periods. If all important determinants of utilization except Medicaid status remain unchanged throughout the study period, the differences in the pre-OBRA and post-OBRA utilization rates for the sample of newly-ineligible persons would provide an estimate of OBRA's influence on access for this subpopulation.

The utilization behavior of the control sample of those with continuing Medicaid eligibility provides a check on the possibility that these other (i.e., non-Medicaid) important determinants of utilization may not remain stable throughout the study period (e.g., a group's health status could be dramatically, albeit temporarily, altered by an influenza epidemic). In all likelihood, comparisons between the treatment and control groups could be properly accomplished only with multivariate statistical techniques. Otherwise, uncontrolled differences between the two groups (e.g., in health, age-sex composition) might lead to erroneous conclusions.

Unfortunately, it is not presently possible to adopt this preferred version of the quasi-experimental research design. Implementation of this design would require a large, presumably nationally representative, data base which not only identifies those rendered ineligible for Medicaid by OBRA, but also follows them over time, gathering information on such characteristics as health-services utilization, health insurance coverage, and so forth. No such data base exists. (Moscovice (1984) has

collected information of this sort for a small sample of newly ineligible persons residing in a single county in Minnesota; however, the geographic narrowness of this sample and the absence of a control group limit greatly the usefulness of these particular data for an evaluation, such as the present one, whose purview is the entire Medicaid program.)

The strength of both the experimental and quasi-experimental research designs described above stems largely from their reliance upon direct observations of utilization and other characteristics of the newly ineligible subpopulation. However, the preceding discussion has made it clear that current data limitations render these two preferred research designs inappropriate for addressing the central question of this study.

Is there some alternative, scientifically sound approach to assessing OBRA's impact on utilization patterns among the newly ineligible subpopulation--an approach which does not rely upon direct observation of the utilization behavior of that subpopulation? The answer to this question becomes apparent once it is recognized that the problem implicit in the question is identical to the problem confronting a policy analyst charged with predicting, or forecasting, the impact of a proposed policy change before that change occurs. For policy analysts, this problem no doubt arises at least as frequently as the problem of assessing a policy impact after implementation of the policy.

Barring some form of social experimentation (an unusual, time-consuming, and costly way to generate data), the prediction or forecasting problems confronting policy analysts are, by definition, never solved by directly observing the actual impacts of the proposed

policy changes. Typically, the prediction problem is resolved by bringing some form of quasi-experimental research design to bear on currently available data embedding behavioral responses to parameter changes similar to the proposed policy change under consideration. That is, the predicted impacts are inferred from indirect, rather than direct, evidence. Obviously, predictions inferred from indirect evidence will generally offer less accuracy than estimates based upon direct observation of behavioral responses to the actual policy change. However, when direct observation is not feasible, reliance upon indirect evidence unquestionably dominates the alternative: sheer speculation.

In the present study this prediction, or forecasting, approach is adopted, from among those feasible to implement, as the scientifically preferred method for assessing OBRA's access implications for the newly ineligible subpopulation. In essence, the research design employed in this evaluation resembles a quasi-experimental design, or, more specifically, a pre-post design with controls.

The basis for this methodology is conventional and stems from the extensive literature on the determinants of health services utilization. The vastness of this literature is suggested clearly, for example, in the Leopold and Langwell (1978) review article, which cites over 400 utilization studies from several disciplines, including economics and sociology. The fundamental presumption underlying this literature is that variation in individual, or group, use of health services stems, in a systematic and fairly stable way, from variation in health status, insurance coverage, various economic and demographic characteristics, and health services supply.

This relationship can be expressed in the form of a utilization equation, written here in its simplest linear form (with the constant term suppressed) merely for expository convenience:

$$U_i = b_1X_{1i} + b_2X_{2i} + \dots + b_nX_{ni} + e_i,$$

where U_i is a measure of the i^{th} person's (or the i^{th} group's) utilization rate for a specific health service; the X_{ji} $(j=1,\dots n)$ represent the various determinants of health services utilization (e.g., health status, type of health insurance coverage, age, sex, race, education, availability of health services), the b_j are estimated coefficients (or partial derivatives) which translate changes in the X_j into changes in utilization behavior, and e_i is a random error term accounting for unexplained variation in utilization.

For any person (or group), utilization can be predicted, provided that the following two conditions are satisfied: 1) the utilization equation(s) relevant to that person (or group) can be estimated, and 2) the characteristics (health status, insurance coverage, and so forth) relevant to that person (or group) can also be determined or estimated. Clearly, the accuracy of any utilization prediction depends critically on the accuracy of the estimates of both the utilization coefficients and the relevant individual (or group) characteristics. If these two components are estimated with tolerable accuracy, the corresponding utilization predictions can be accepted as reliable. On the other hand, if the coefficients or characteristics are not well estimated, the predictions would merit little confidence.

Development of reliable predictions of OBRA's impact on the use of health services by the newly ineligible subpopulation accordingly hinges on the success of the following two endeavors. The first entails specification and estimation of utilization equations capable of isolating the access implications of losing Medicaid eligibility. As a result of data limitations (described above), it was necessary to estimate the utilization equations with data from the 1980 calendar year, a period well before the October 1981 effective date of OBRA. In an effort to assure the reliability of the coefficient estimates--especially those pertaining to Medicaid eligibility--unusual attention was devoted to developing and estimating utilization equations applicable to the subpopulation of persons rendered ineligible for Medicaid by OBRA. This effort is described in the next section of the paper.

The second crucial step in developing reliable predictions of OBRA's access implications involves estimation of the characteristics of the newly ineligible subpopulation (the other key ingredient in the prediction routine). Since this subpopulation could not be observed directly (due to data limitations described above), it was again necessary to devote considerable attention to developing alternative indirect measurement approaches. These efforts to develop reliable measures of the characteristics of the newly ineligible subpopulation are discussed in a subsequent section.

Utilization Equations

Data--

The principal source of data for this part of the study is the National Household Survey (HHS) component of the National Medical Care Utilization and Expenditure Survey (NMCUES). Supplemental data for merging to NMCUES-HHS were obtained from the Administrative Records Survey (ARS) component of NMCUES and from the 1984 Area Resources File. (A detailed discussion of NMCUES is provided in Appendix A, but also see National Center for Health Statistics, 1983; for a description of the Area Resources File, see Health Resources and Services Administration, February 1984.)

The National Household Survey was designed to represent the civilian, noninstitutionalized population of the United States. Data were collected on slightly more than 17,000 persons for the calendar year 1980, through five rounds of interviews conducted at approximately twelve-week intervals beginning in early 1980 and ending in mid-1981. For purposes of the present evaluation, NMCUES-HHS yields 2,038 observations on Medicaid enrollees (including both full- and part-year enrollees) and similarly situated low-income nonenrollees. The specific reasons for selecting only about 12 percent of the total NMCUES-HHS sample for this analysis are explained below.

The NMCUES files contain the necessary information for estimating utilization equations, including detailed utilization, insurance status, health status, economic, and demographic data. However, while this

general type of information is clearly necessary to the present evaluation, it is not unique to NMCUES-HHS. In particular, the same general information is available from the Health Interview Survey (HIS). In fact, since the HIS is conducted annually by the National Center for Health Statistics (see, for example, National Center for Health Statistics, December 1981), it offers a source of data for periods preceding, concurrent with, and following the implementation of OBRA. In contrast, NMCUES-HHS pertains to a pre-OBRA period exclusively. Superficially, this fact above appears to suggest that the HIS might be better than NMCUES-HHS as a source of data for the current evaluation. However, such is not the case.

The principal reason the HIS is not useful for this study stems from the nature of the information provided by the bank of questions about health insurance coverage. The HIS reveals only whether a person was covered by a specific form of insurance, such as Medicaid, at any time during the survey year. Accordingly, it is not possible to identify persons who might have lost Medicaid eligibility as a result of OBRA (or any other reason, for that matter). The HIS simply does not distinguish between persons eligible, say, for one month of Medicaid coverage during the year and those eligible for the entire year. Thus, with HIS data, one cannot separate the newly ineligibles from those with continuing Medicaid eligibility. Moreover, since the HIS does not follow the same individuals over time, it is likewise not possible to distinguish 1) those persons who, having lost Medicaid eligibility in the year preceding the survey year (for instance, in 1981) remained ineligible for

the entire survey year (say, 1982), from 2) those persons who were never enrolled in Medicaid. Since the HIS does not permit identification of those losing Medicaid eligibility (as a result of OBRA or any other cause), it represents a rather unhelpful source of data, given the purposes of the present evaluation.

In sharp contrast, NMCUES provides detailed information about insurance-coverage periods during the survey year. By combining information from NMCUES-ARS with NMCUES-HHS, it is possible to establish, for each person, whether the coverage period for a specific form of health insurance was full- or part-year. Moreover, for those either acquiring or losing some form of insurance coverage during the 1980 survey year, it is possible to determine the date that coverage either began or ended, respectively. Consequently, precise determination of the form of an individual's health-insurance coverage for any day during 1980 is feasible with NMCUES.

This feature--the precision of measurement of insurance coverage--represents the principal advantage of NMCUES--relative to data sources such as the ~~HHS~~HIS--for analyzing the issues raised here. Precise measurement of insurance-coverage status, and of changes in that status, enhance greatly the likelihood the utilization-equation methodology will yield accurate estimates of the coefficients which translate insurance-coverage status (including Medicaid coverage, private health insurance coverage, and no coverage) into health-services utilization rates. Without such accurate estimates, it would simply not be possible to develop reliable predictions of OBRA's impact on the use of health services by the newly ineligible subpopulation.

Sample-selection criteria--

A critical step in the process of developing predictions of OBRA's impact on the newly ineligible subpopulation is the creation of a NMCUES-HHS sample bearing a reasonably close resemblance to that newly ineligible subgroup. The presumption is, of course, that the greater the similarity, the greater the accuracy of the predictions of OBRA's impact. The various sample-selection criteria employed in pursuit of this objective are discussed in this section.

Within the context of a quasi-experimental research design, such as that employed here, an assessment of OBRA's impacts on the newly ineligible subpopulation requires NMCUES-HHS data on both Medicaid recipients and "similarly situated" nonrecipients. Ideally, the Medicaid sample would be limited to those families with substantial earned income, since OBRA's target was precisely the working poor and near-poor on AFDC/Medicaid. However, sample-size considerations forced the adoption of an alternative approach to controlling for potential differences between the Medicaid recipients with substantial earned income and those with little or no earned income. In the end, after application of all the other sample-selection criteria, NMCUES-HHS provides only 983 observations on Medicaid recipients (including both full- and part-year recipients). Imposing an earned-income criterion on the sample-selection process greatly diminishes this sample size, by as much as 60-75 percent of entire sample, depending upon the specific criterion adopted. In order to avoid cutting the sample size by such an extent, the potential

influence of labor market activity on the use of health services is taken into account by including appropriate variables (discussed below) in the utilization equation, rather than through stratifying the sample. (A number of other sample-selection criteria were also employed in developing a NMCUES-HHS sample for representing the AFDC/Medicaid population; these criteria are discussed later in this subsection.)

The first step toward representing the newly ineligible subpopulation in the post-OBRA period involves selecting a sample of NMCUES-HHS observations on poor and near-poor nonrecipients. Obviously, the presumption is that the utilization behavior of the middle- and higher-income families represented on NMCUES-HHS is not pertinent to the questions under consideration here. Accordingly, only those persons with family incomes less than $15,000 (in 1979) were considered for inclusion in the sample of nonrecipients. This sample-selection criterion limits the nonrecipient sample to persons with family incomes which would place them in the bottom one-third of the family income distribution for 1979 (Welniak and Henson, 1984). Under ideal circumstances, the income cutoff might have been set at a lower level, perhaps at $10,000 or $12,000. However, sample-size considerations pointed to the higher income standard. Following application of all the other sample-selection criteria, the number of NMCUES-HHS observations on nonrecipients of AFDC/Medicaid is 1,055. Setting the income cutoff at $12,000 would have reduced the nonrecipient sample by 40 percent, whereas setting it at $10,000 would have cut this sample by approximately 65 percent.

Several other sample-selection criteria are clearly implied by the nature of OBRA's target population: AFDC/Medicaid families with substantial earned income. First, all of the AFDC/Medicaid families losing eligibility as a result of OBRA obviously would have contained dependent children. Accordingly, in constructing the analysis samples from NMCUES-HHS, only those observations on dependent children and their parents were included. Persons excluded as a result of this criterion encompass all single adults, married persons with no dependent children, parents or "other" relatives (that is, individuals not part of the immediate family) of the head of the household, and persons with an unknown relationship to the head of household. (In order to implement this sample-selection criterion, special programming to create a "family-structure" variable was required; see Appendix A for further discussion.)

The distribution of observations by family structure--generated by application of this sample-selection criterion (along with all the others)--is described in Table 1. For the most part, the Medicaid sample comprises observations on children living typically in a single-parent family headed by a female. Among the sample of adult enrollees, a majority of the observations are, of course, on these female heads. In the low-income nonenrollee sample, both of these groups--that is, the children in female-headed families and the female heads--are not as well represented as in the enrollee sample. Children in the low-income nonenrollee sample are somewhat more likely to live in a family where both parents are present, and the adults in the sample are more likely to

Table 1

Distribution of NMCUES Observations by Family Structure

Individual and Family Structure Characteristic	Analysis Sample: Medicaid Enrollees Full or Part Year	Analysis Sample: Low Income Nonenrollees	Sample of Nonenrollees, All Income Levels[a]
		(percent of sample)	
Child:			
Living in a single-parent family headed by a female	40.1	21.3	7.3
Living in a single-parent family headed by a male	0.9	1.0	0.9
Living in a two-parent family	29.9	32.6	43.7
Adult:			
Female head of a single-parent family	16.1	11.0	3.5
Male head of a single-parent family	0.1	0.4	0.4
Female spouse in a two-parent family	8.1	16.9	22.1
Male spouse in a two-parent family	4.8	16.9	22.1
Sample size	983	1,055	7,373

[a] Represents the 71 percent of the entire nonelderly, nonMedicaid population residing in families with dependent children.

SOURCE: Authors' tabulations of data from the 1980 National Medical Care Utilization and Expenditure Survey.

be a spouse in a two-parent family. Nevertheless, these two family structure distributions still bear a reasonable similarity to one another. This similarity becomes especially clear when these two distributions are compared to the one for the entire U.S. population of nonelderly and nonenrolled persons living in families with children present. -- Within this broader population, individuals are roughly seven times more likely to live in a traditional two-parent family than in a single-parent family (even including those headed by males). In contrast, in the sample of low-income nonenrollees, the frequency of observations on persons in two-parent families is only about twice as great as that for single-parent families. Among the sample of Medicaid enrollees, the observations are about evenly divided between these two general family structures.

Most of those AFDC/Medicaid recipients affected by OBRA would have been nonelderly, largely because the AFDC population contains few elderly, but also because OBRA concentrated on families with earned income (relative to nonelderly adults, the elderly are simply far less likely to earn income). This characteristic of the newly ineligible population was captured by limiting the NMCUES-HHS analysis samples to nonelderly persons (specifically, persons less than 65 years of age).

Among the nonelderly, some blind or disabled persons gain access to Medicaid benefits through their eligibility for the federal Supplemental Security Income (SSI) program: with certain limited exceptions, eligibility for SSI assures eligibility for Medicaid. This group of Medicaid recipients would have been unaffected by the OBRA changes in

AFDC/Medicaid eligibility rules. Consequently, all NMCUES-HHS observations on SSI/Medicaid recipients were excluded from the analysis samples.

Virtually all of the persons affected by the OBRA AFDC/Medicaid eligibility changes would have belonged to the noninstitutionalized population. Conceivably, some institutionalized persons in certain "AFDC-related" Medicaid groups--for instance, institutionalized persons who would qualify for AFDC were they not in an institution qualify for Medicaid in some states (see Sawyer et al., 1983)--may have lost Medicaid eligibility as a result of the OBRA changes; however, the number affected would have been extremely small, since the number of persons in the relevant AFDC-related groups is itself quite small. This characteristic of the newly ineligible population was taken into account implicitly by the sampling design for NMCUES: the survey encompassed the noninstitutionalized population only.

The several preceding sample-selection criteria were employed in an effort to create a NMCUES-HHS analysis sample resembling the newly ineligible subpopulation. A number of other sample-selection criteria were also necessary, principally to facilitate accurate measurement of certain variables. First, while most of the individuals represented on NMCUES-HHS participated in all five waves of the survey, a few were eligible for, or responded to, only some of the waves of questionnaires. Observations on such persons (i.e., the part-year survey eligibles) were excluded from the analysis samples, for the obvious reason of incomplete information on health services utilization, insurance coverage, and other key variables.

Another sample-selection criterion arose from the fact that values for some variables were occasionally imputed, as part of the process of constructing the NMCUES data files (National Center for Health Statistics, August 1983). For purposes of the present study, the analysis samples are limited to those observations based upon complete information provided by survey respondents or developed from administrative records (e.g., as was the case in determining ultimately an individual's eligibility status for Medicaid or Medicare). This criterion applies only to those variables actually pertinent to the multivariate analyses. Imputations on variables not relevant to the present study were not cause for excluding observations from the analysis samples.

In some instances, incomplete information on a variable is simply recorded in the NMCUES data files as a missing value, rather than replaced by an imputed value. The problem of missing values lead to the creation of a sample-selection criterion essentially identical to the one employed to deal with the problem of imputed values: that is, missing values for key variables would lead to the exclusion of an observation from the analysis samples.

Another important sample-selection criterion arose from the need to develop useful and accurate measures of health insurance coverage. For reasons explained more fully below, most of the multivariate analyses in this study concentrate on monthly utilization rates. The insurance coverage variables were defined accordingly: that is, for the analyses of monthly utilization rates, they were designed to reflect the type of

health insurance covering an individual during a month. In those instances where the form of health insurance coverage changed during a month, the change usually occurred either at the beginning of the month or at the end. However, in some cases, insurance coverage changed at other times during the month. For example, a few individuals had no health insurance for one part of a month, but were covered by private health insurance for the other part of the month. It would be possible to deal with these complex forms of insurance coverage by adding a set of equally complex insurance coverage variables to the utilization equations. However, since these complex forms of coverage occur infrequently, it would not be possible, in general, to estimate the corresponding coefficients with much precision. Accordingly, an alternative approach was taken. Specifically, the data files for the analysis of variation in utilization rates for any specific month were limited to observations on individuals experience 1) no change in health insurance coverage during that month, or 2) a change occurring at the beginning or the end of that month. To clarify the implications of this sample-selection criterion, consider the example of a person with no insurance coverage from January 1 to May 15 and private health insurance from May 16 until December 31. In accordance with the foregoing sample-selection rule, observations on this person would be included in the monthly data files for January through April and for June through December; the observation for May, when the form of insurance coverage changed in the middle of the month, would be excluded from the data file for May. In contrast, had the coverage change in this example occurred

at the end of April or the beginning of May, this observation would have been included in the May data file.

Implementation of these various sample-selection rules yield a sample in which the predominant insurance coverage categories are: 1) no coverage, 2) Medicaid only, 3) private coverage only, and 4) both Medicaid and private coverage. However, a few observations fell into such coverage categories as CHAMPUS, VA, Medicare, CHAMPUS and Medicaid, and so forth. These forms of coverage are not especially pertinent to this evaluation, as they are unlikely to be generally available to those families losing eligibility for AFDC/Medicaid as a result of OBRA. Consequently, only observations on those persons falling into one of the four principal coverage categories (that is, no coverage, Medicaid, private coverage, and both Medicaid and private) are included in the analytic data files.

Nearly all of the NMCUES-HHS observations are on blacks (11.5 percent) or whites (86.3 percent), including persons of hispanic origin. The remaining 2.2 percent of the observations pertain to "other races"; that is, American Indians, native Alaskans, Asians, and Pacific Islanders. As the final step in creating the analysis samples, all observations on these other races were excluded from the data files.

To summarize the discussion in this section, a variety of sample-selection criteria were employed in constructing NMCUES-HHS analysis samples to represent the newly ineligible subpopulation. Specifically, in order to be included in the analysis samples, observations had to satisfy the following conditions:

- a Medicaid enrollee, or
- a low-income nonenrollee (that is, a nonenrollee living in a family with income less than $15,000);
- a dependent child or a parent with one or more dependent children present;
- nonelderly (that is, less than 65 years of age);
- non-SSI recipient;
- noninstitutionalized;
- eligible for participation in the entire survey;
- provided information on all variables pertinent to this survey (that is no imputations or nonresponses to key variables);
- either not covered by health insurance or covered by Medicaid only, by private health insurance only, or by both Medicaid and private insurance; and
- a member of either the black or white race, including persons of hispanic origin.

Application of the above criteria to the 17,123 person NMCUES-HHS sample resulted in 2,038 cases for analysis--983 Medicaid enrollees and 1,055 low income nonenrollees. Of the 15,085 observations not used in this analysis, over 90 percent were excluded by the income, family structure, and age criteria. the remainder were omitted for more technical reasons assuring appropriate measurement of the key variables.

Variables--

This study analyzes the sources of variation in several measures of health services utilization. Two of these measures were selected because they reflect the use of the principal required health services under Medicaid: 1) ambulatory physician services and 2) inpatient hospital

services. In addition, the analysis also focuses on four other utilization measures reflecting the use of important optional services under Medicaid: 1) prescription drugs, 2) dental services, 3) eye examinations, and 4) eyeglasses. The formal definitions for these six dependent variables are provided in Table 2.

Most of the multivariate analyses rely upon variables indicating monthly utilization rates. Although, some of the analyses concentrate on annual utilization rates. However, in both instances utilization is measured as a binary variable. For the analysis of variation in monthly utilization rates, the dependent variables indicate whether or not a specific health service was used during the month. Similarly, for the analysis of variation in annual utilization rates, they reflect whether or not the service was used during the year.

Typically, utilization studies investigate the sources of variation not only in the probability of using a health service (that is, the foregoing binary measure of utilization), but also in the level of use among users of that service (e.g., annual number of physician visits, annual inpatient days). However, since other studies usually measure utilization in terms of annual rates, variation in level-of-use variables would be much greater than in the present instance, where the principal concern centers on monthly utilization rates. For many health services (although excepting inpatient-hospital days and prescription drug purchases), level-of-use variables exhibit relatively little variation when measured on a monthly basis.

Table 2

Definitions of Variables for the Utilization Equations

Category/Variable Name	Definition
Alternative Dependent Variables:	
Physician visit:	1 if individual had one or more physician visits during the analysis period, 0 otherwise.
Hospital episode:	1 if individual had one or more inpatient hospital episodes during the analysis period, 0 otherwise.
Prescription drug use:	1 if individual purchased prescribed medicine one or more times during the analysis period, 0 otherwise.
Dental services:	1 if individual had one or more dental visits during the analysis period, 0 otherwise.
Eye examination:	1 if individual had one or more eye examinations (from either an optometrist or an ophthamologist) during the analysis period, 0 otherwise.
Eyeglasses:	1 if individual purchased one or more pairs of eyeglasses during the analysis period, 0 otherwise.
Independent Variables:	
Health insurance coverage:	
No coverage:	1 if person not covered by any health insurance during the analysis period, 0 otherwise (the reference category in the utilization equations).
Medicaid coverage:	1 if person covered only by Medicaid during the analysis period, 0 otherwise.
Private coverage only:	1 if person covered only by some form of private health insurance during the analysis period, 0 otherwise.

Table 2 (cont.) - page 2

Category/Variable Name	Definition
Medicaid and private coverage:	1 if person covered by both Medicaid and private health insurance throughout the analysis period, 0 otherwise.
--	
Medicaid entry and exit (applies to monthly utilization equations only):	
First month on Medicaid:	1 if the analysis period is person's first month on Medicaid, 0 otherwise.
Second month on Medicaid:	1 if the analysis period is person's second month on Medicaid, 0 otherwise.
Last month on Medicaid:	1 if the analysis period is person's last month on Medicaid, 0 otherwise.
Next-to-last month on Medicaid:	1 if the analysis period is person's next-to-last month on Medicaid, 0 otherwise.
Other month on Medicaid:	1 if the analysis period is not person's first, second, last, or next-to-last month on Medicaid, 0 otherwise (the reference category in the utilization equations).
Health Status:	
Self-assessment of health status:	
Excellent health:	1 if self-assessment is excellent, 0 otherwise (the reference category in the utilization equations).
Good health:	1 if self-assessment is good, 0 otherwise.

Table 2 (cont.) - page 3

Category/Variable Name	Definition
Fair health:	1 if self-assessment is fair, 0 otherwise.
Poor health:	1 if self-assessment is poor, 0 otherwise.
Health limits activity:	1 if person cannot perform usual activities or is limited in the performance of usual activities, 0 otherwise.
Pregnant:	1 if person is female who was pregnant sometime during 1980, 0 otherwise.
Age-sex classifications:	
Age less than 1 year, either sex:	1 if person fits this description, 0 otherwise.
Age 1 to 5 years, either sex:	1 if person fits this description, 0 otherwise.
Age 6 to 11 years, either sex:	1 if person fits this description, 0 otherwise
Male, age 12 to 17 years:	1 if person fits this description, 0 otherwise.
Male, age 18 to 44 years:	1 if person fits this description, 0 otherwise.
Male, age 45 to 64 years:	1 if person fits this description, 0 otherwise.
Female, age 12 to 17 years:	1 if person fits this description, 0 otherwise.
Female, age 18 to 44 years:	1 if person fits this description, 0 otherwise (the reference category in the utilization equations).

Table 2 (cont.) - page 4

Category/Variable Name	Definition
Female, age 45 to 64 years:	1 if person fits this description, 0 otherwise.
--	
Race-ethnicity:	
Black, nonhispanic:	1 if race of nonhispanic person is black, 0 otherwise.
White, nonhispanic:	1 if race of nonhispanic person is white, 0 otherwise (the reference category in the utilization equations).
Hispanic origin, any race:	1 if person's origin is hispanic, regardless of race, 0 otherwise.
Married:	1 if person is married, 0 otherwise.
Family size:	number of persons in participant's family.
Educational attainment (of individual or of head if individual is less than 17 years of age):	
0 to 8 years:	1 if person's (or head's) last year of formal education was between 0 and 8 years, 0 otherwise (the reference category in the utilization equations).
9 to 12 years:	1 if person's (or head's) last year of formal education was between 9 and 12 years, 0 otherwise.
Some college:	1 if person's (or head's) last year of formal education was greater than 12 years, 0 otherwise.

Table 2 (cont.) - page 5

Category/Variable Name	Definition
Place of residence:	
Region:	
Northeast:	1 if person's residence was in the Northeast region, 0 otherwise (the reference category in the utilization equations).
North Central:	1 if person's residence was in the North Central region, 0 otherwise.
Southern:	1 if person's residence was in the Southern region, 0 otherwise.
Western:	1 if person's residence was in the Western region, 0 otherwise.
Nonmetropolitan residence:	1 if person lived in a nonmetropolitan area, 0 otherwise.
Full time worker, part or full year:	1 if person worked full time for either part or all of the year, 0 otherwise.
Work-insurance interactions:	
Full time worker, Medicaid coverage only:	1 if person was a full time worker sometime during the year and covered by Medicaid during the analysis period, 0 otherwise.
Full time worker, Medicaid and private coverage:	1 if person was a full time worker sometime during the year and covered by both Medicaid and private health insurance, 0 otherwise.

Table 2 (cont.) - page 6

Category/Variable Name	Definition
Supply measures:	
Patient care MDs:	the number of patient care physicians per 10,000 population in 1980 (appears in the physician, hospital, and drug utilization equations).
Hospital beds:	the number of short term community hospital beds per 1,000 population in 1980 (appears in the hospital utilization equations only).
Pharmacies:	the number of pharmacies per 10,000 population in 1977 (the latest year available) (appears in the drug utilization equations only).
Dentists:	the number of patient care dentists per 10,000 population in 1980 (appears in the dental utilization equations only).
Vision care specialists:	the number of patient care optometrists (in 1978) and ophthamologists (in 1979) per 10,000 population (appears in the vision services utilization equations only).
Other:	
Percent fluoridation:	the percentage of the population living in an area of the county offering fluoridated water (appears in the dental utilization equations only).

The multivariate analyses relate variation in health services utilization to a variety of determinants or independent variables. (In general, the variables used in implementing the sample-selection criteria would have appeared explicitly as determinants in the utilization equation had they not been used implicitly as determinants in stratifying the data.) Basically, these determinants account for underlying variation in individual health insurance coverage, health status (including pregnancy), employment status, age, sex, race and ethnic background, education, marital status, family size, place of residence, and the availability of relevant health services. The formal definitions for these variables are reported in Table 2. Most of these variables represent standard determinants for utilization equations, and consequently require no further discussion at this point.

The one exception is the set of variables pertaining to Medicaid entry and exit. The two variables pertaining to entry into the Medicaid program--specifically, those indicating whether any given month is a person's first or second month on the Medicaid rolls--are designed to account for the possibility that new enrollees may use health care services at unusually high rates, to compensate for care previously postponed (that is, "catching-up" behavior). Similarly, the other two variables--next-to-last-month-on-Medicaid and last-month-on-Medicaid--are included in the model to allow for the likelihood that an impending exit from the Medicaid rolls will also stimulate unusually high rates of utilization (that is, "stocking-up" behavior). These entry and exit variables apply to specific months, so they are appropriate only for the

analyses of monthly utilization rates. No comparable variables appear in the annual utilization equations. Although, for some of the analyses of annual utilization, the entry and exit information was used (along with other information on changes in private coverage) to limit the samples to those remaining in a single coverage category for the entire year.

Estimation procedure--

As noted in the preceding section, all of the utilization measures in this study are scaled as binary variables. Accordingly, both the monthly and the annual utilization equations are estimated with the probit estimation procedure (see, e.g., Daganzo, 1979).

In analyzing the variation in annual utilization rates, separate sets of equations were estimated 1) for those with "full-year" insurance coverage only (i.e., a single form of coverage, including self-insurance, for the entire year), and 2) for those with either full-year or part-year coverage (where the "part-year" coverage category includes those experiencing changes in their insurance coverage sometime during the year). Typically adding the observations for part-year coverage increases the sample size by roughly 15-20 percent.

For estimating the monthly utilization equations, NMCUES provides 12 monthly samples, each containing approximately 2,300 observations. There are various econometric approaches to analyzing data involving both cross-section and time-series observations (see, e.g., Maddala, 1977). Largely as a result of the availability of large samples, the present study adopts a relatively simple approach. In effect, the coefficients

and standard errors are first estimated separately for each of the 12 cross sections. Then, for every coefficient or standard error, the resulting 12 estimates are combined to form a weighted average where the weights are proportionate to sample size. (For computational convenience, the weighted-average monthly coefficients, reported in Appendix B, Tables B-2 through B-7, were calculated by simply pooling the 12 monthly data sets and estimating a single equation for each health service; however, such an approach understates the estimated standard errors, so they were calculated by actually estimating 12 separate equations and then computing a weighted-average for each one.) Since this approach ignores the time-series component in the data, the estimated standard errors will be larger than those some other approaches would have produced. However, with such large samples, statistical efficiency does not represent a great concern.

Characteristics of the Newly Ineligible Subpopulation

As noted in a preceding discussion, predicting OBRA's utilization impacts on the newly ineligible population requires not only estimates of the utilization equations relevant to that group, but also information about the characteristics of that population. In this section, an approach to developing that essential information on the characteristics of the newly ineligible population is described.

Under ideal circumstances, values for the relevant variables would be established through a survey of the newly ineligible population. However, as no such survey has been conducted, it is necessary to rely upon more inferential approaches to the problem.

Most of the population characteristics were estimated with data from the 1982 and 1983 March Current Population Surveys (CPS). The CPS is based on a stratified probability sample of the civilian noninstitutionalized population of the United States (see Appendix A for a detailed discussion of this data source; see also Bureau of the Census, various years). Aside from the decennial census, the CPS is the most comprehensive and reliable source of general demographic and economic information available. The March component of the CPS concentrates on employment and earnings patterns, in addition to collecting detailed demographic and other economic information. In general, the information pertains to the calendar year preceding the survey; for example, most of the data generated by the March 1983 survey applies to the 1982 calendar year.

The CPS does not collect information either about health services utilization or, with certain minor exceptions, about health status. Accordingly, it does not serve as a source of data for estimating utilization equations. Nevertheless, it is still a potentially useful source of data, as it provides information on all of the utilization determinants, excepting the health status and availability-of-health-services measures.

For present purposes, an important aspect of the CPS arises from the following two features: 1) nearly all CPS families are interviewed for two consecutive years; and 2) observations on the same families over the two years can be linked through a special programming routine (see Appendix A for further discussion). Thus, by linking the 1982 and 1983

surveys, it is possible to develop a sample of observations on individuals who were dropped from the Medicaid rolls sometime during 1981 and who did not return to them in 1982. After imposing the various sample-selection criteria implied by the nature of the newly ineligible population (see the discussion in the preceding section on utilization equations), the linked CPS yields 527 observations on such persons.

Using this linked-CPS sample as a source of information on many of the characteristics of the newly ineligible population is not an approach completely free of problems. A potentially serious problem arises from the fact that it is impossible to distinguish those actually dropped from the Medicaid rolls as a result of OBRA from those who would have left the rolls even in the absence of OBRA. If the characteristics of these two groups differ greatly, the estimates derived from the linked-CPS sample may poorly represent the actual characteristics of the newly ineligible population.

A comparison with similar linked-CPS samples for 1979-1980 and 1980-1981 provides a rough check on the validity of this approach to characterizing the newly ineligible population. This test hinges on the following assumption: in the absence of OBRA, the characteristics of those leaving the Medicaid rolls in each of the three years (i.e., 1979, 1980, and 1981) would differ little, if at all. If this assumption is granted, then major differences between the characteristics of the 1981-82 linked sample and those of the 1979-80 and 1980-81 samples could be attributed to OBRA affecting a group quite dissimilar to those otherwise exiting from the Medicaid rolls. Of course, the problem with

this simple test is the absence of controls for other factors (such as the 1981 recession) which could also alter the nature of the group leaving the Medicaid rolls.

Table 3 contains the relevant means and proportions both for the 1981-82 linked-CPS sample and for the combined samples for 1979-80 and 1980-81 (n=841). It also reports the results of statistical tests for significant differences in the values assumed by the variables in the two time periods.

In summary, most of the CPS variables differ insignificantly over time. Indeed, among the five significant differences indicated in the table, only two--the proportion with 9-12 years of education and the proportion residing in the North Central states--achieve the 99 percent level of confidence. The other three differences are significant only at the 90 percent confidence level. This pattern of generally insignificant differences supports the use of the 1981-82 linked-CPS data to characterize the newly ineligible population. Accordingly, the 1981-82 values reported in Table 3 provide much of the necessary information on the characteristics of the newly ineligible population.

Still missing are estimates for the health status variables for the newly ineligible population. Since the CPS does not collect information about health status, these estimates must be developed from other sources of data. One possibility involves simply taking the health status information from the NMCUES-HHS analysis samples (that is, the data with which the utilization equations are estimated). However, this approach suffers from a potential major drawback. Health status estimates derived

Table 3

Selected Demographic and Economic Characteristics of Persons Exiting the Medicaid Program: A Comparison between 1979-1980 and 1981

Characteristic	Means and Proportions 1979-1980	Means and Proportions 1981
Age less than 1 year, either sex	.021	.038*
Age 1 to 5 years, either sex	.128	.153
Age 6 to 11 years, either sex	.268	.240
Male, age 12 to 17 years	.097	.100
Male, age 18 to 44 years	.113	.092
Male, age 45 to 64 years	.032	.020
Female, age 12 to 17 years	.090	.069
Female, age 18 to 44 years	.252	.257
Female, age 45 to 64 years	.052	.031*
Hispanic origin, any race	.066	.063
Black, nonhispanic	.352	.404*
Married	.215	.179
Family size	4.64	4.34
Education: 9 to 12 years	.626	.706***
Education: some college	.247	.225
Nonmetropolitan residence	.271	.277
Northeast residence	.227	.195
Southern residence	.381	.359

Table 3 (cont.)

Characteristic	Means and Proportions	
	1979-1980	1981
North Central residence	.223	.273***
Western residence	.169	.173
Full time worker, part or full year	.196	.186
Sample size	841	527

* The 1981 value is significantly different from the 1979-1980 average value at the 90 percent level of confidence for a two-tailed test.

*** The 1981 value is significantly different from the 1979-1980 average value at the 99 percent level of confidence for a two-tailed test.

SOURCE: Authors' tabulations from the March Current Population Survey for various years.

in this fashion apply to a rather broad spectrum of the Medicaid and non-Medicaid population, not just to that subpopulation exiting from the Medicaid program (i.e., the analog to the newly ineligible subpopulation). Those moving off the AFDC/Medicaid rolls may exhibit quite different patterns of health status than either the general AFDC/Medicaid recipients or the low-income nonrecipients represented in the NMCUES-HHS analysis samples.

Developing the health status estimates from the NMCUES-HHS subsample of those exiting Medicaid seems a natural solution to this problem. Unfortunately, after implementation of the various sample-selection criteria, the number of observations on this group is only 105, too few to provide a very accurate picture of the health status pattern among those exiting the Medicaid rolls.

The resolution to the problem was provided by the State Medicaid Household Survey (SMHS) component of NMCUES. This part of the survey (described further in Appendix A; see also National Center for Health Statistics, 1983) involved a sample of approximately 4,000 Medicaid households divided evenly among California, Michigan, New York, and Texas. Since these data are obviously not nationally representative, the NMCUES-HHS data are more suitable for a program evaluation, provided sample sizes are adequate. However, as sample sizes diminish, the relevance of the criterion of national-representativeness similarly diminishes.

After imposition of the various sample-selection criteria, NMCUES-SMHS yields 1,317 observations on individuals exiting the Medicaid

rolls sometime during 1980. The health status information on these persons is reported in Table 4, along with similar data for the general AFDC/Medicaid sample from NMCUES-SMHS (excluding those exiting Medicaid). An examination of these data reveal statistically significant differences in the health status patterns for these two groups. Compared to the rest of the AFDC/Medicaid population, those exiting the Medicaid program are:

- more likely to be in good or excellent health;
- less likely to have an activity-limiting health problem; but
- more likely to have been pregnant sometime during the year.

This last result is, no doubt, partly a reflection of the fact that women of childbearing age comprise a larger fraction of the exiting population than of the remainder of the AFDC/Medicaid population: 26 as compared to 22 percent.

The health status measures for the exiting population, reported in Table 4, are the values used in predicting OBRA's effect on access to health services among the newly ineligible population.

Before proceeding with a discussion of the prediction results, it is necessary to establish a set of values for a final group of utilization determinants: the health services supply variables. A reasonable, although admittedly arbitrary, approach to this problem is simply to adopt the national averages for these variables (weighted in accordance with the NMCUES-HHS population distribution). That is the approach adopted here. Unless the geographic distribution for the newly ineligible population is substantially different from that for the

Table 4

Selected Health Status Characteristics: A Comparison between Those Exiting and Those Remaining on Medicaid

Health Status Characteristic	Proportion of Persons Exiting the Medicaid Program	Proportion of Persons Remaining in the Medicaid Program
Self-assessment of health status:		
Excellent or Good	.791***	.723
Fair or Poor	.219***	.277
Limited in activities	.109***	.160
Pregnant	.058***	.038
Sample size	1,317	5,285

*** The value for those exiting Medicaid is significantly different from the value for those remaining on Medicaid at the 99 percent level of confidence for a two-tailed test.

SOURCE: Authors' tabulations from the State Medicaid Household Survey component of the 1980 National Medical Care Utilization and Expenditure Survey.

general U.S. population, these averages represent unbiased estimates of health services availability for the newly ineligible population. In the end, these variables merit little attention, for their influence on utilization tends to be statistically insignificant.

The Predictions: OBRA's Impact on Access among the Newly Ineligible

The study's principal findings are reported in this section. These findings are presented in a series of histograms, which reveal predicted utilization rates for those losing AFDC/Medicaid eligibility as a result of OBRA. The utilization measure depicted in these histograms is the number of persons per 1,000 population using a specific health service at least once during the month.

For each health service (physician visits, inpatient hospital admissions, and so on), two sets of predictions are presented for the newly ineligible population: 1) the utilization rate that could have been expected had Medicaid eligibility been preserved; and 2) the utilization rate actually attained without the advantage of Medicaid eligibility. All predictions are adjusted for other determinants of utilization, so the predicted variation in utilization between the two circumstances (that is, with OBRA and without OBRA) arises entirely from the variation in Medicaid eligibility.

Following the loss of Medicaid eligibility, approximately 55 percent of the newly ineligible population either acquired or retained some form of private health insurance coverage, while the other 45 percent went uninsured (based upon estimates presented in Long and Settle, 1984). With certain exceptions (explained below), separate predictions are presented for both outcomes: that is, 1) moving from the Medicaid coverage category to the private coverage category, and 2) moving from the Medicaid coverage category to the no coverage category.

Only the principal findings are discussed in this section. The detailed estimates for both the monthly and annual utilization equations are reported in Appendix B.

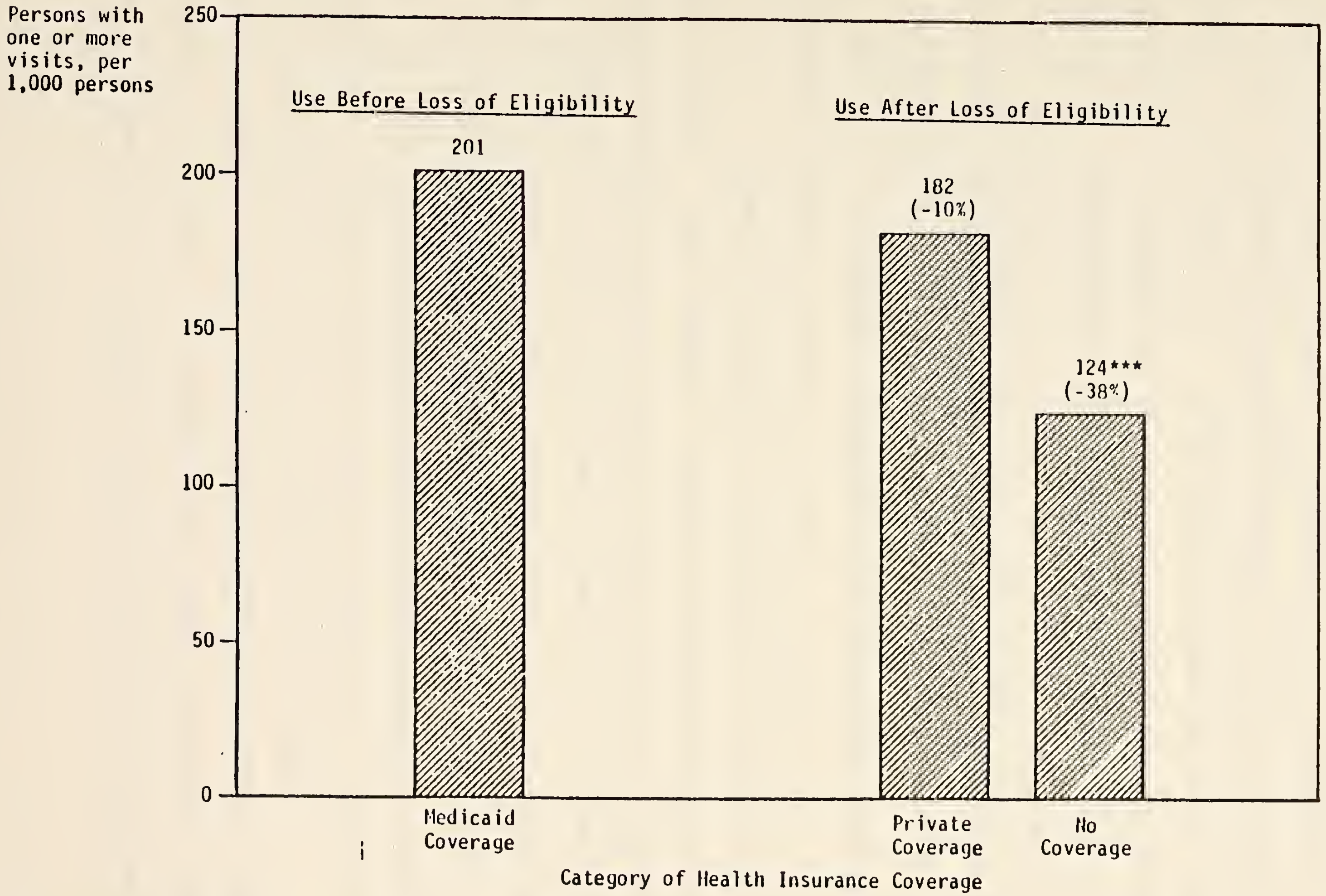
Physician Services

The predictions for the use of physician services by the newly ineligible subpopulation are presented in Figure 1. According to the prediction results, had Medicaid eligibility been retained, 201 persons per 1,000 of the newly ineligible subpopulation would have visited a physician at least once during a typical month. However, as a result of OBRA and the consequent loss of Medicaid eligibility, the use of physician services among the newly ineligibles fell short of that level, although the extent of the shortfall depends critically upon whether private health insurance replaced Medicaid coverage.

For those acquiring (or retaining) private health insurance coverage following the loss of Medicaid eligibility, the physician utilization rate fell by 10 percent, from 201 to 182. This decline is not statistically significant at conventional levels of confidence. By contrast, among those newly ineligibles failing to acquire private coverage, the physician utilization rate dropped by 38 percent, from 201 to 124. This difference is statistically significant at the 99 percent confidence level. An identical pattern of declining use of physician services following the loss of Medicaid eligibility is also apparent from the multivariate analysis of annual (rather than monthly) utilization rates (see Table B-2 in Appendix B).

Figure 1

Monthly Use of Physician Services Before and After the Loss of Medicaid Eligibility, Adjusted for Other Determinants



***Significantly less than the Medicaid utilization rate at the 99 percent level of confidence for a one-tailed test.

SOURCE: Authors' estimates based upon data from the 1980 National Medical Care Utilization and Expenditure Survey, and the March 1982 Current Population Survey.

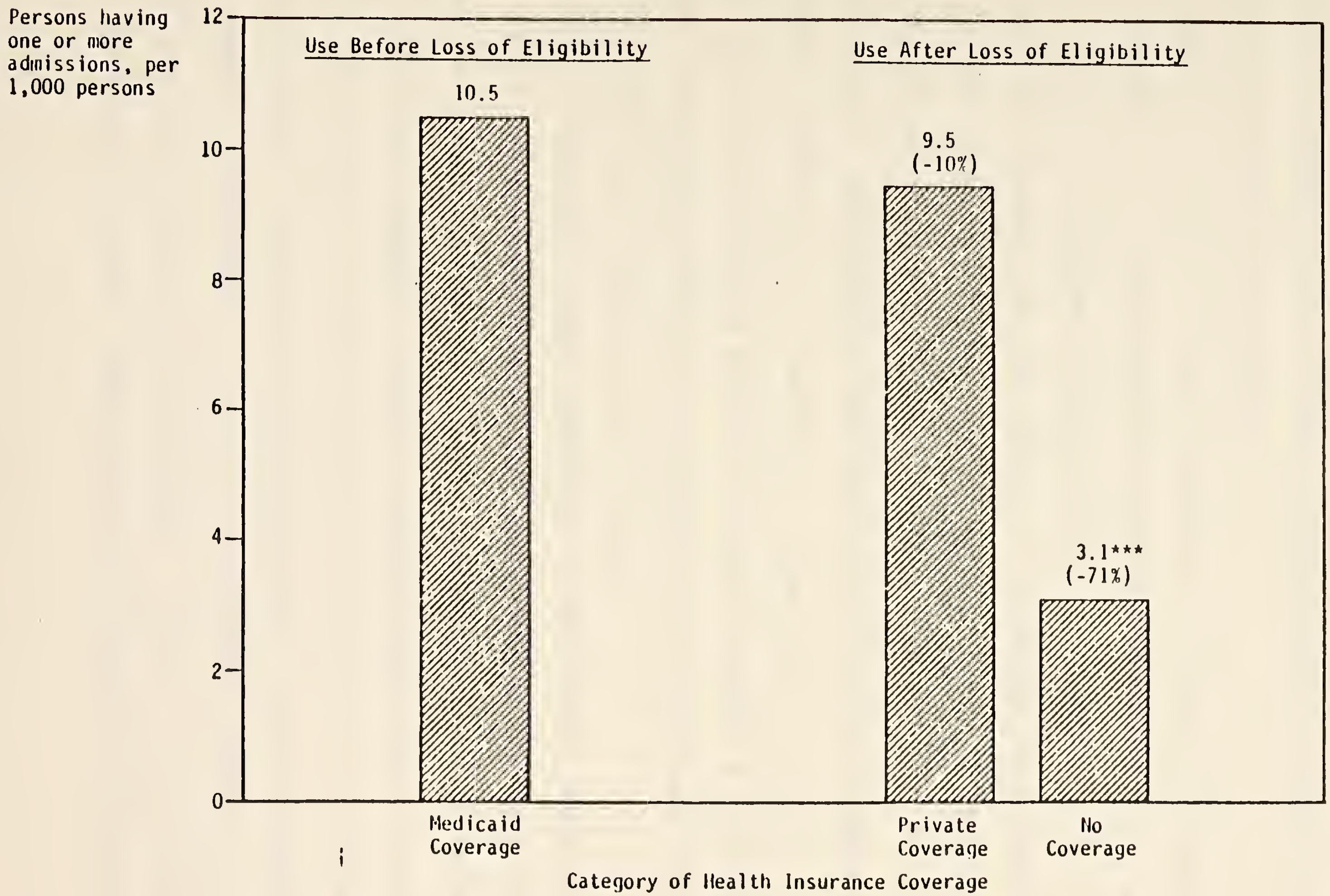
Inpatient Hospital Services

The central findings pertaining to the use of inpatient hospital services by the newly ineligible subpopulation are presented in Figure 2. (For a complete set of detailed monthly and annual estimates, see Table B-3 in Appendix B.) The predictions suggest that, in the absence of OBRA, an average of 10.5 persons per 1,000 members of the newly ineligible subpopulation would have used inpatient hospital services in a typical month. For those eventually covered by some form of private health insurance, the consequence of losing Medicaid coverage does not appear serious, at least according to this specific utilization measure. Shifting from Medicaid coverage to private health insurance causes predicted hospital utilization to drop by 10 percent, from a rate of 10.5 to 9.5. However, this change is statistically insignificant at conventional levels. (For hospital services, significance tests are based upon the estimates from the annual utilization equations. Weighted average t-values for the monthly coefficient estimates were not computed, since some of the monthly estimates failed to converge due to the relative infrequency of hospital episodes in those months. This lack of convergence in some of the individual monthly samples was not a problem in estimating the weighted average monthly coefficients as they were derived from a pooled sample of all the individual monthly samples.)

In sharp contrast, those newly ineligibles failing to obtain some private coverage alternative to Medicaid experienced, according to the predictions, a dramatic 71 percent decrease in their use of inpatient

Figure 2

Monthly Use of Inpatient Hospital Services Before and After Loss of Medicaid Eligibility, Adjusted for Other Determinants



***Significantly less than the Medicaid utilization rate at the 99 percent level of confidence for a one-tailed test.

SOURCE: Authors' estimates based upon data from the 1980 National Medical Care Utilization and Expenditure Survey, and the March 1982 Current Population Survey.

hospital services, from a rate of 10.5 to 3.1. This sharp decline is statistically significant at the 99 percent level of confidence. The estimated equations for annual hospital utilization (see Appendix B) lead to the same prediction of a 70-some percent decline in hospital use following the loss of Medicaid coverage.

The magnitude of this predicted reduction in the use of inpatient hospital services is so large that the question of whether, for some reason, it might be overstated naturally arises. This prediction is, of course, only an estimate and, as such, it is subject to estimation error. Yet, the standard errors on the estimated insurance coefficients in the hospital equations are relatively small (see Table B-3). So even the lower bound of the 99 percent confidence interval on the estimate of the Medicaid coefficient--an extremely conservative estimate of Medicaid's role in determining hospital use rates--suggests a reduction in the use of hospital services of approximately 50 percent among those newly ineligibles failing to obtain private coverage.

Of course, there are other, more subtle, statistical issues that could be raised, concerning the accuracy of the coefficient estimates and underlying the prediction results. Extreme differences in health status patterns between the various insurance coverage groups might bias the estimates. For example, if the uninsured were typically in far better health than Medicaid enrollees, the estimated impact of losing Medicaid coverage could be overstated (provided the correlations between health status and insurance coverage were very strong). However, in the present case the correlations between health status and insurance coverage are

weak; so they could not bias the predictions. (To illustrate, the activity limitation variable has a simple correlation of -.03 with the no coverage variable, -.06 with the private coverage variable, and .06 with the Medicaid coverage variable; a level far too small to create statistical problems.) This low correlation between insurance coverage and health status is, no doubt, due partly to the exclusion of the SSI-disabled and the elderly from the Medicaid analysis sample.

The utilization equations assume insurance coverage to be an independent variable. Yet, some Medicaid enrollees surely attain that status as the result of a hospital episode (e.g., which causes them to "spend-down" into eligibility for medically-needy coverage). To the extent that observations on such enrollees are in the analysis samples, the Medicaid coefficient in the hospital equation could very well be biased upward, implying that the utilization consequences of losing Medicaid coverage (and moving into the uninsured category) would be overstated. However, there are two reasons to conclude that this potential source of bias does not represent a problem in the present study. First, the monthly equations contain transition variables to control for unusual utilization patterns, such as exceptionally high use of hospital services during the first few months on the program. Second, those annual estimates for the sample in which insurance status remained unchanged for the entire year yield identical implications to those derived from the other samples. If "reverse causality" were a serious problem, the estimates for this sample--where insurance coverage does not change during the year--would have revealed a much smaller Medicaid

influence on hospital use. Not observing any such outcome adds confidence that the estimate of a 71 percent reduction in hospital utilization is correct.

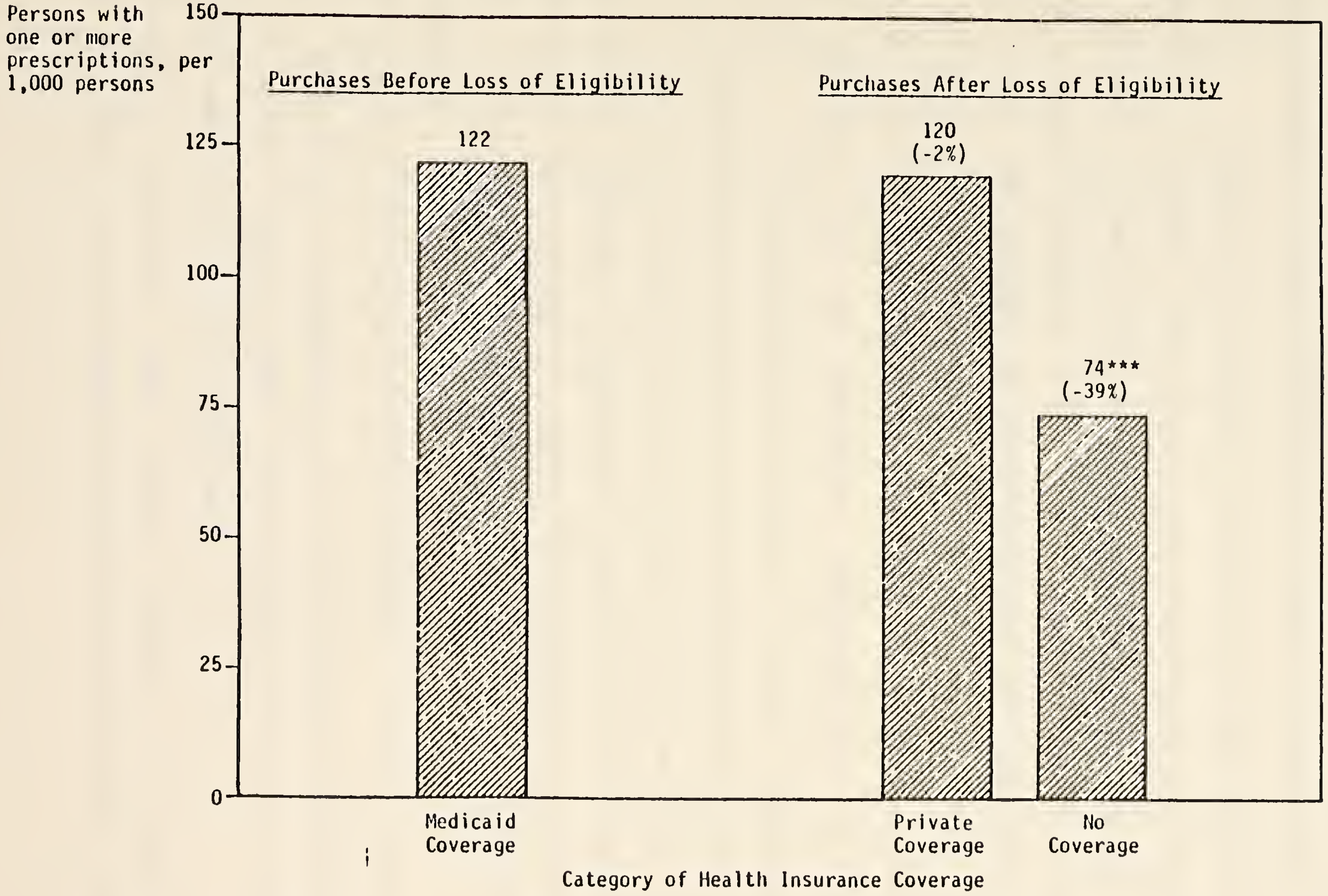
Prescription Drug Purchases

As might have been anticipated, the pattern of predictions for prescription drug purchases closely parallels that for physician services: prescription drug purchases often stem directly from a physician visit. The predictions for this service are depicted in Figure 3.

With continuing Medicaid eligibility, 122 persons per 1,000 members of the newly ineligible subpopulation would have made prescription drug purchases during a typical month. For those obtaining some form of private health insurance, the consequence of losing Medicaid eligibility is a negligible, and statistically insignificant, 2 percent decline in the prescription drug utilization rate, from 122 to 120 per 1,000 newly ineligibles. However, among those with no coverage following the loss of Medicaid eligibility, the use of prescription drugs drops by 39 percent, or from 122 to 74 persons per 1,000. This reduction in utilization is statistically significant at the 99 percent confidence level. Once again, the estimates pertaining to annual utilization rates reveal essentially the same pattern of use.

Figure 3

Monthly Purchase of Prescription Drugs Before and After the Loss of Medicaid Eligibility, Adjusted for Other Determinants



***Significantly less than the Medicaid utilization rate at the 99 percent level of confidence for a one-tailed test.

SOURCE: Authors' estimates based upon data from the 1980 National Medical Care Utilization and Expenditure Survey, and the March 1982 Current Population Survey.

Dental Services

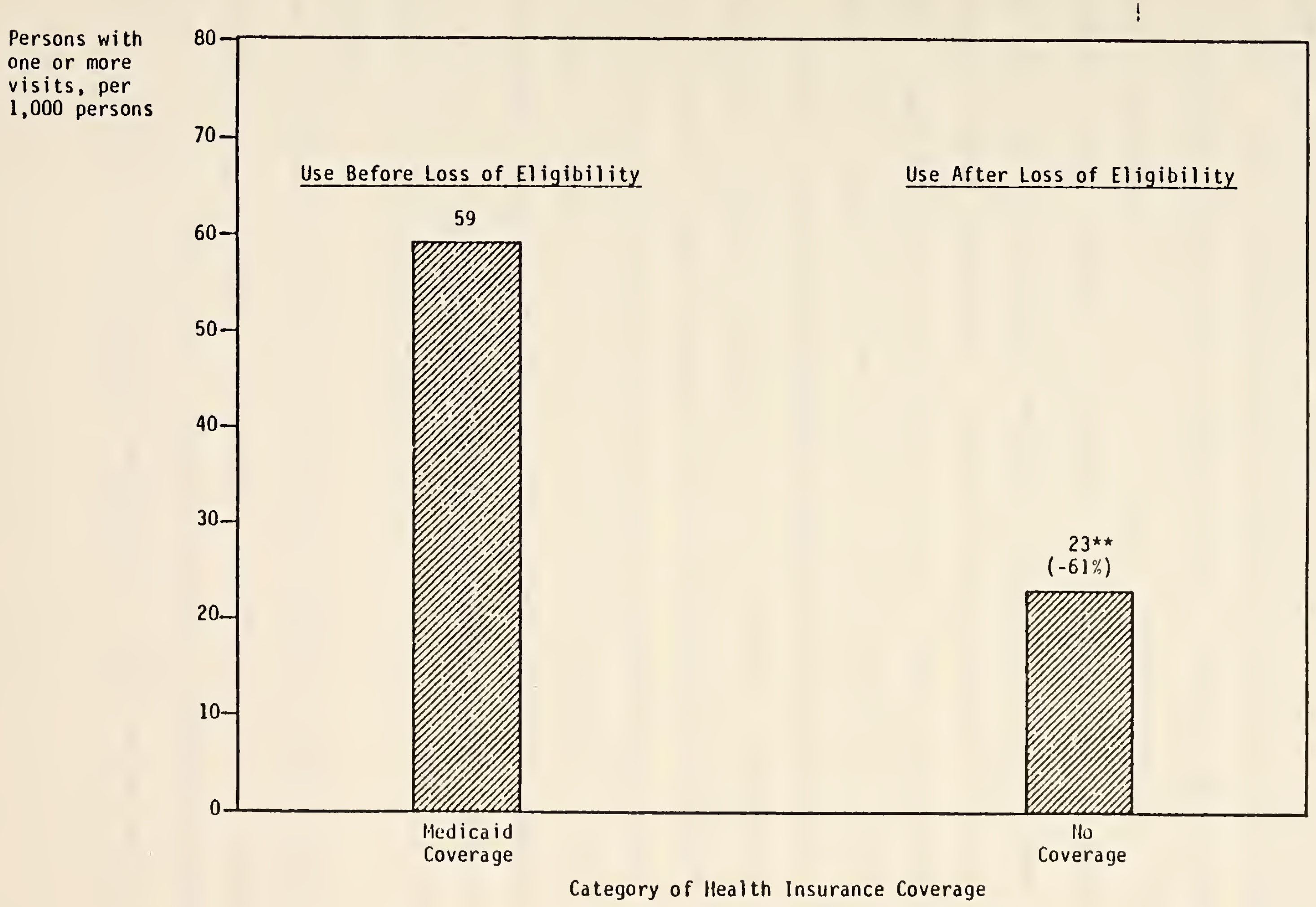
State Medicaid programs are not required to cover dental services, although they may elect to provide such coverage. For example, in 1981 35 states offered at least some coverage for dental services (Sawyer et al., 1983). In analyzing variation in the use of optional services, it is necessary to account for the fact that such services are available through Medicaid to some recipients but not to others, depending upon the state in which the recipients reside. (Similar concerns did not arise in connection with the analysis of prescription drug purchases, since all states represented on NMCUES covered this optional service.) This aspect of optional services was taken into account in the present instance through imposition of an additional sample-selection criterion. Specifically, in analyzing dental utilization, the analysis samples were limited to observations on Medicaid enrollees and low-income nonenrollees living in states providing Medicaid coverage for dental services. As a consequence, the samples for estimating the dental utilization equations are smaller than those employed in estimating the equations for physician services, inpatient hospital services, or prescription drug purchases (see Appendix B).

The prediction results are portrayed in Figure 4. In the absence of OBRA, 59 persons per 1,000 members of the newly ineligible subpopulation (living in states covering dental services) would have used dental services at least once during an average month.

The actual utilization rates attained following loss of Medicaid coverage for dental services depend critically on whether private dental

Figure 4

Monthly Use of Dental Services Before and After the Loss of Medicaid Eligibility, Adjusted for Other Determinants



**Significantly less than the Medicaid utilization rate at the 95 percent level of confidence for a one-tailed test.

SOURCE: Authors' estimates based upon data from the 1980 National Medical Care Utilization and Expenditure Survey, and the March 1982 Current Population Survey.

insurance is acquired. Among those newly ineligible persons successful in replacing Medicaid coverage of dental services with private dental insurance, no significant change in dental utilization rates would have been expected, based upon the prediction results (see Table B-5 in Appendix B). Yet, this result is not depicted in Figure 4. The reason for this omission is that only a relatively small fraction of the newly ineligible subpopulation would have replaced Medicaid dental coverage with private dental insurance, certainly a far smaller fraction than the estimated 55 percent replacing Medicaid medical and hospital coverage with private health insurance. Based upon tabulations of data from NMCUES-HHS, approximately 16.7 percent of the entire nonelderly and nonMedicaid U.S. population had separate dental insurance coverage in 1980. Moreover, among the low-income segment of this population, only 8.4 percent had separate coverage for dental services. Presumably, the extent of private dental coverage in the newly ineligible subpopulation would be no greater than that observed in this low-income population. In other words, at best only about 1 in 12 newly ineligibles would have acquired private coverage to replace the lost Medicaid coverage for dental services, leaving private dental coverage as an unrealistic alternative for the overwhelming majority of the newly ineligible subpopulation.

Loss of Medicaid coverage for dental care implies a sharp decline in the use of those services when private coverage is not obtained. According to the predictions, shifting from the Medicaid coverage category to the no coverage category--a shift experienced by

approximately 92 percent of those previously covered by Medicaid dental insurance--causes the use of dental services to drop by 61 percent, or from a rate of 59 users per 1,000 population to 23 per 1,000. Based upon the weighted average t-values from the monthly equations, this difference is statistically significant at the 95 percent level of confidence. The annual estimates would place the significance level at 99 percent.

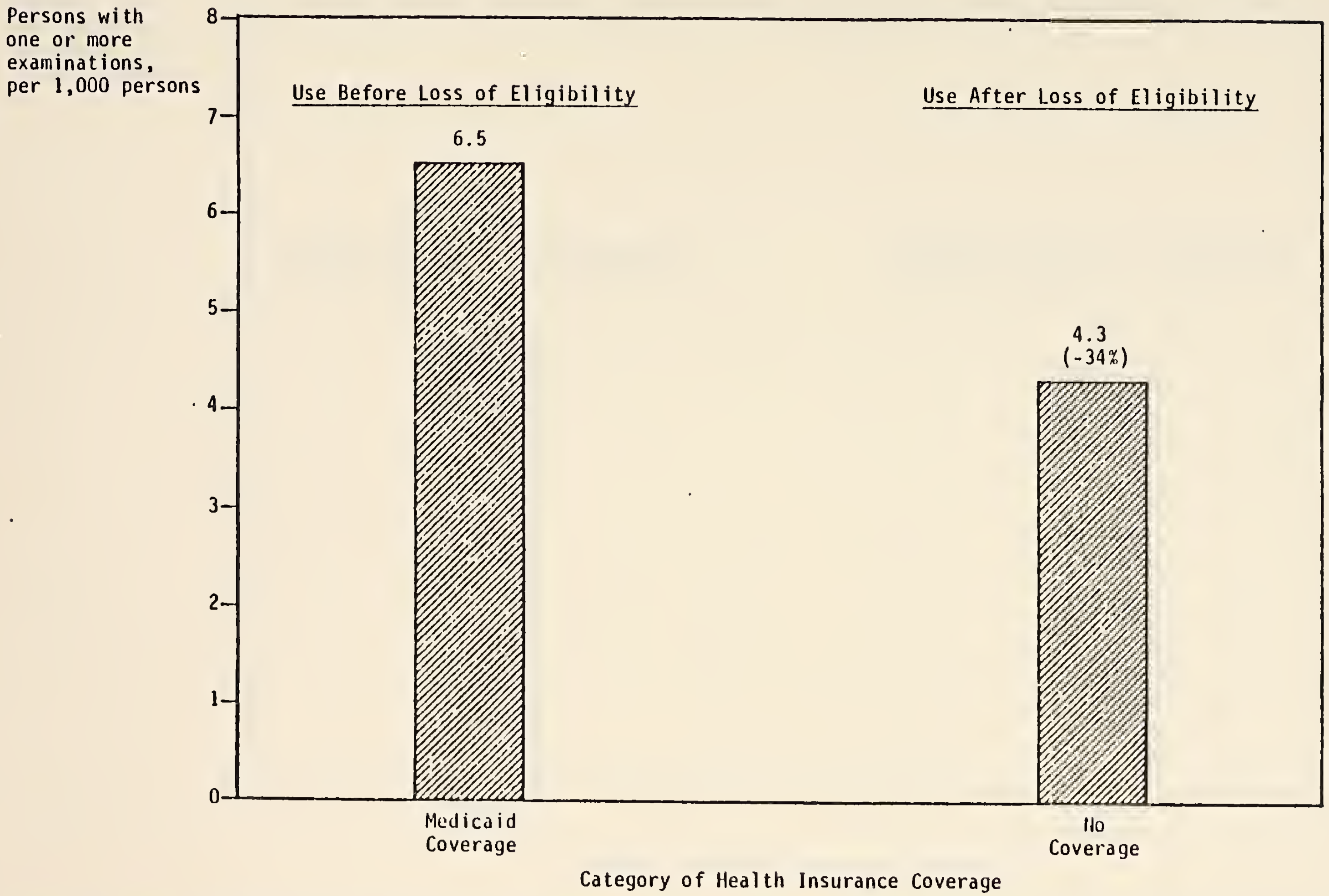
Vision Services

The discussions for the two vision services--eye examinations and eyeglasses purchases--are combined in the present section, owing to the close connection between the services and to the similarity in the findings. The services are optional services under the Medicaid program. In 1981, 42 states covered eye examinations, while 39 provided for eyeglasses purchases (Sawyer et al., 1983). In analyzing the sources of variation in vision services, it was therefore necessary to distinguish between those Medicaid enrollees and nonenrollees residing in states which covered vision services and those living in states not providing for such services. Observations on the former group comprise the analysis sample for vision services; observations on the latter group were dropped from the sample.

As a general rule, vision services are not covered through private health insurance. Accordingly, the vision services utilization equations do not contain a private coverage variable. The vision services models (and Figures 5 and 6, where the predictions are presented) distinguish only between the Medicaid coverage category and the no coverage category.

Figure 5

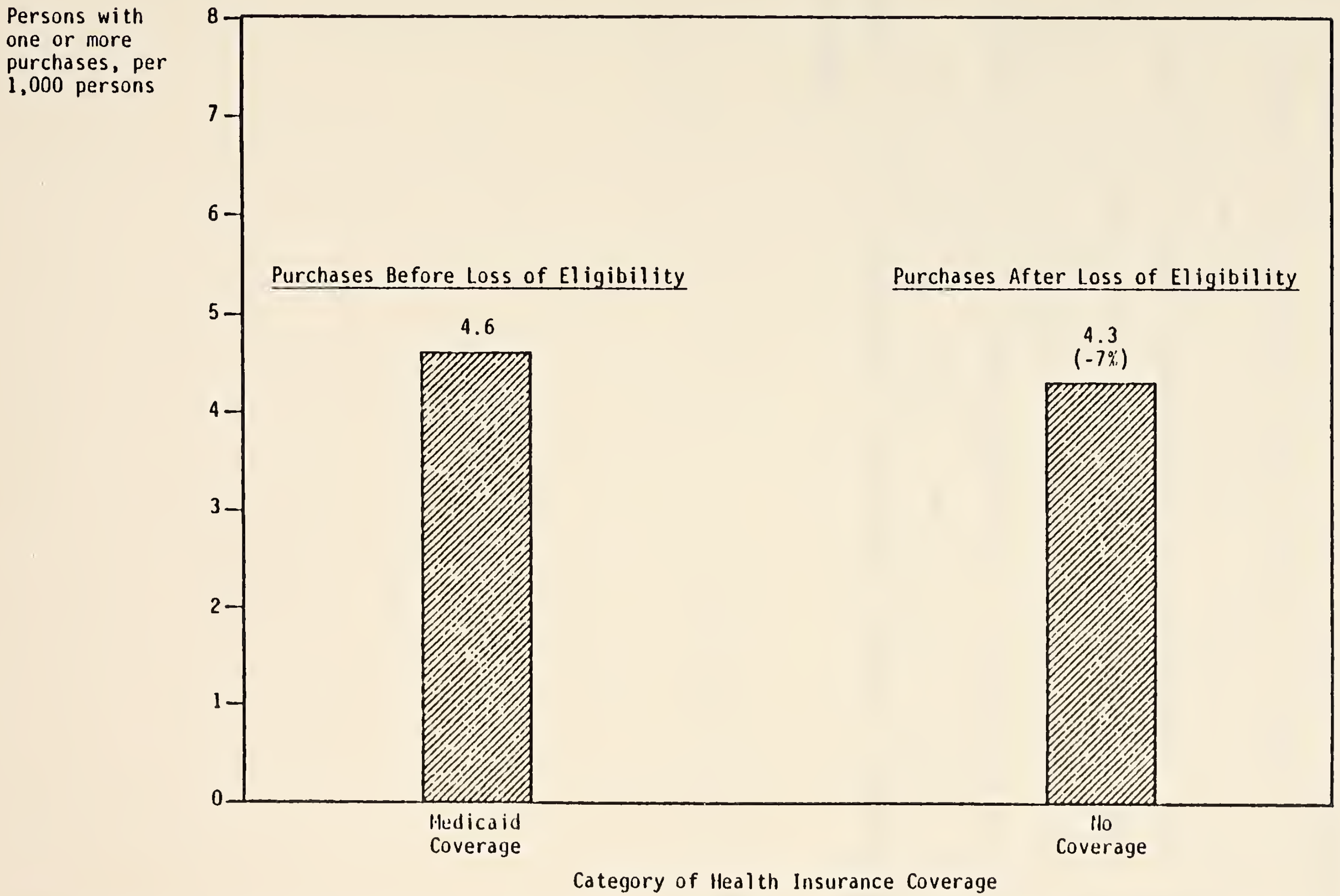
Monthly Use of Eye Examinations Before and After the Loss of Medicaid Eligibility, Adjusted for Other Determinants



SOURCE: Authors' estimates based upon data from the 1980 National Medical Care Utilization and Expenditure Survey, and the March 1982 Current Population Survey.

Figure 6

Monthly Purchase of Eyeglasses Before and After the Loss of Medicaid Eligibility, Adjusted for Other Determinants



SOURCE: Authors' estimates based upon data from the 1980 National Medical Care Utilization and Expenditure Survey, and the March 1982 Current Population Survey.

The predicted utilization rates, under Medicaid coverage, are 6.5 users per 1,000 persons for eye examinations and 4.6 users per 1,000 persons for eyeglasses purchases. The predictions suggest that loss of Medicaid coverage would lead those in the newly ineligible subpopulation (living in states which cover these vision services) to reduce use of eye examinations by 34 percent and eyeglasses purchases by 7 percent. Clearly, these point estimates seem to bear little similarity. Yet, they are similar in the sense that both are statistically insignificant (see Tables B-6 and B-7 in Appendix B). This result is at least partly, and perhaps entirely, due to the limited variation in the use of these vision services. In the monthly analysis samples, only 0.9 percent had eye examinations and 0.8 percent made prescribed purchases of eyeglasses in an average month.

Summary

The principal findings of this study can be summarized as follows:

- Those newly ineligibles successful in replacing Medicaid with private health insurance--roughly one half of the newly ineligible population--experienced an insignificant decline in their use of ambulatory physician services, inpatient hospital services, and prescription drugs.

- In contrast, those newly ineligibles failing to acquire alternative coverage experienced large, statistically significant declines in their use of basic health services.

- Specifically, among those acquiring no alternative coverage, the OBRA-induced loss of Medicaid eligibility appears to have lowered the use of physician services by 38 percent, the use of inpatient hospital services by 71 percent, and the purchases of prescription drugs by 39 percent.

- Loss of Medicaid coverage for dental services implies a 61 percent reduction in the use of those services; this conclusion applies to approximately 92 percent of those losing Medicaid dental coverage, as only about 8 percent would have obtained replacement private dental insurance.

- While the findings pertaining to the use of vision services seem roughly consistent with the foregoing conclusions, the estimates were too imprecise to actually yield statistically significant results.

Suggestions for Further Research

In connection with the present study, there are several issues or questions meriting further investigation. The first question is:

- How much did these OBRA-induced reductions in Medicaid enrollments actually lower Medicaid program costs?

The answer to this question is not transparent, since the characteristics--and especially the health status characteristics--of the newly ineligible subpopulation seem to differ from those for the general AFDC/Medicaid population. Such differences imply differences in average utilization rates and, thus, in average program expenditures as between these two groups. Accordingly, in estimating program cost savings, it is inappropriate to rely upon program data on average outlays for the AFDC/Medicaid population. Such an approach fails to account for the differences between the newly ineligible subpopulation and the rest of the AFDC/Medicaid population. This question will be addressed in a forthcoming report by the Syracuse University team.

The present study found substantial declines in health services utilization rates following the loss of Medicaid eligibility, at least among those newly ineligibles failing to acquire alternative private health insurance. These findings are important and useful in their own right. Yet, they are limited in that they reflect only a certain dimension of access to health services. Other dimensions, related more to the quality of health services than to the quantity, are not considered here. While these other dimensions are often difficult, if

not impossible to quantify and analyze, there is one such aspect which can be addressed analytically with data from NMCUES. Specifically, the issue pertains to the effect OBRA may have had on where the newly ineligibles receive ambulatory physician care; or, stated as a question:

- To what extent did the OBRA-induced loss of Medicaid eligibility cause a change in the places where the newly ineligibles sought ambulatory physician care (e.g., shifting from a doctor's office to a neighborhood health center or perhaps to the emergency room of a public hospital)?

This issue is also presently under investigation by the Syracuse University team.

A third area for further investigation arises from the fact that the multivariate methods employed in the present study did not fully exploit all of the information available in the NMCUES analytic data files. In particular, two aspects could be explored further. First, the main analytic files were created by pooling cross-section and time-series data. In analyzing these data, the present study relied upon a relatively straightforward method, ignoring a variety of highly sophisticated multivariate procedures for analyzing pooled cross-section/time-series data. Likewise, the present study ignores the possibility of "intrafamily correlation" (Manning et al., 1981): that is, a person's utilization rate may be determined partly by the utilization rate of other family members. The robustness of the principal findings presented here makes it unlikely that further statistical analyses, to account for these two problems, would alter the results much. However, the importance of the findings suggests that the additional investigation would be worthwhile.

A final suggestion for further research arises from the possibility that enrollees in transition--either coming onto or exiting from the Medicaid rolls--may use health services at unusually high rates. The monthly utilization equations, on which the predictions in this study are based, contain variables to account for such unusual utilization behavior. The estimated coefficients on these transition variables are typically large and positive (see the tables in Appendix B), suggesting that both "catching-up" and "stocking-up" utilization behavior among Medicaid enrollees may be important. However, due to the limited number of observations on those entering or exiting the Medicaid rolls, the standard errors of the estimates for the coefficients on the transition variables are also relatively large, so the specific point estimates for the transition effects reported here merit little confidence.

Precise estimates of these transition coefficients would prove very useful in addressing certain questions. To cite just one example, consider the problem of estimating Medicaid program cost savings from changes in eligibility rules (such as the OBRA changes) which reduce the number of Medicaid enrollees. If "stocking-up" utilization is substantial, the prospect of losing Medicaid eligibility may produce a large, albeit temporary, increase in program costs. Such a cost increase must be taken into account in order to accurately estimate the short term cost savings from reducing Medicaid enrollments.

Large claims files, such as the Medicaid Quality Control Data or the Tape-to-Tape Data, no doubt provide the best opportunity for obtaining precise estimates of both "catching-up" and "stocking-up" effects. Of

course, a complete assessment of transition behavior--that is, one which accounts for utilization behavior both before and after the transition--would require survey data for monitoring behavior either before entering or after exiting the Medicaid rolls.

REFERENCES

Bureau of the Census: March Current Population Survey Technical Documentation. Prepared by Data User Services Division, Data Access and Use Staff. Washington. U.S. Department of Commerce, various years.

Campbell, D.T. and Stanley, J.C.: Experimental and Quasi-Experimental Designs for Research. Boston. Houghton Mifflin, 1963.

Cromwell, J. et al.: The Evolution of State Medicaid Programs. DHHS-ASPE Grant No. 066A-83. Chestnut Hill, Mass. Center for Health Economics Research, June 1984.

Daganzo, C.: Multinomial Probit. New York. Academic Press, 1979.

General Accounting Office: An Evaluation of the 1981 AFDC Changes: Initial Analyses. GAO-PEMD-84-6. Washington. U.S. Government Printing Office, March 1984.

Health Resources and Services Administration: User Documentation for the ODAM Area Resource File. Prepared by Office of Data Analysis and Management, Bureau of Health Professions. Rockville, Md. Public Health Service, Department of Health and Human Services, February 1984.

Leopold, J.R. and Langwell, K.M.: The Demand for Health Care with Special Emphasis on Cost Containment: A Review of the Literature. In National Commission on the Cost of Medical Care, 1976-77, Volume 3. Monroe, Wisconsin. American Medical Association, 1978.

Long, S.H. and Settle, R.F.: The Impact of Eligibility Changes under the Omnibus Budget Reconciliation Act of 1981 on the Characteristics of the Medicaid Population. DHHS-HCFA Contract No. 500-83-0058. Syracuse, N.Y. Metropolitan Studies Program, Maxwell School, Syracuse University, November 1984.

Maddala, G.S.: Econometrics. New York. McGraw-Hill, 1977.

Manning, W.G. et al.: A Two-Part Model of the Demand for Medical Care: Preliminary Results from the Health Insurance Study. In van der Gaag, J. and Perlman, M., eds.: Health, Economics, and Health Economics. Amsterdam. North-Holland Publishing Company, 1981.

Moscovice, I.: The Impact of Federal Cutbacks on Health Care for Low-Income Children. Paper presented at the Annual Meeting of the American Public Health Association. Anaheim, CA. November 14, 1984.

National Center for Health Statistics: Current Estimates from the National Health Interview Survey: United States, 1980. DHHS Pub. No. (PHS) 82-1567. Public Health Service, Department of Health and Human Services. Washington. U.S. Government Printing Office, December 1981.

National Center for Health Statistics: Public Use Data Tape Documentation, National Medical Care Utilization and Expenditure Survey, 1980. Washington. Public Health Service, Department of Health and Human Services, August 1983.

Sawyer, D. et al.: The Medicare and Medicaid Data Book, 1983. HCFA, DHHS Pub. No. 03156. Baltimore, Md. Health Care Financing Administration, December 1983.

Welniak, E.J. and Henson, M.F.: Money Income of Households, Families, and Persons in the United States: 1982. Current Population Reports. Series P-60, No. 142. Bureau of the Census, U.S. Department of Commerce. Washington. U.S. Government Printing Office, February 1984.

APPENDIX A

Technical Description of the Individual Level Data Bases

National Medical Care Utilization and Expenditure Survey

The National Medical Care Utilization and Expenditure Survey (NMCUES) provides information on health services utilization and expenditures, health insurance coverage, health status, and demographic and socioeconomic characteristics of the civilian, noninstitutionalized population of the United States in 1980. The survey was conducted by Research Triangle Institute (RTI) in conjunction with National Opinion Research Center and SysteMetrics, Inc., especially for use in evaluating the Medicaid and Medicare programs.

NMCUES consists of two independently drawn multistage probability samples: 1) the National Household Sample (HHS), and 2) the State Medicaid Household Sample (SMHS). The HHS component consisted of over 17,000 individuals from approximately 6,000 households across the nation. SMHS was restricted to a sample of Medicaid eligibles from California, Michigan, New York and Texas, totaling over 13,000 individuals from 4,000 households (1,000 per state). Each household was interviewed five times over a 14-month period in 1980-81. A core questionnaire was administered each time to collect data on respondents' health care use, expenses, insurance coverage, and health status indicators during the preceding period. A summary of responses was introduced in every interview after the first to verify previous answers. Supplementary questionnaires were administered during the first, third and fifth interviews to collect data

which were invariant over the survey year. In addition, administrative records for 1980 were obtained from federal Medicare (Parts A and B) and state Medicaid files, allowing a merge of claims records to survey records for every Medicare respondent and for Medicaid respondents in the SMHS sample. Claims records were not obtained for Medicaid respondents in the HHS sample, but requests were made for each state to supply data on the eligibility status of its Medicaid respondents.

Because of the panel nature of the survey, NMCUES is rich in detail not commonly available from annual surveys. Multiple interviews diminished the length of the recall period; respondents were urged to keep accurate records of health care use and expenditures during the survey year; and answers were validated by the respondents themselves in subsequent sessions. NMCUES followed the same respondents across time, a feature which provides the unique opportunity to track changes in health insurance coverage and to link that coverage with utilization and expenditure behavior.

The administrative records survey enhances the validity of the survey data in several ways. First, claims records for Medicare and Medicaid SMHS respondents allowed verification of survey responses regarding program eligibility and use of medical care services. In addition, these claims files provided data on charges which were often unknown to respondents who did not pay for services directly. Administrative records were also used to validate the monthly eligibility status of Medicaid HHS respondents; and, to address the common problem of inhibited reporting of Medicaid coverage, the responses of a sample of low income persons claiming no Medicaid eligibility were similarly verified.

The Medicaid Program Evaluation (MPE) team at Syracuse University was granted access to a wealth of NMCUES data in addition to the public-use version of the HHS data tape. First, data files constructed by RTI as part of its HCFA contract deliverables (hereafter referred to as "RTI files") were made available. These files provided the non-public-use SMHS counterpart to public-use person, condition, and visit-level files on HHS. The RTI files also supplied data on the verified eligibility status and health insurance coverage of all HHS and SMHS respondents across the survey year. These insurance coverage data were especially important to MPE analysis because they provided the ability to track Medicaid recipients as they moved on and off the program and to link this movement directly to utilization data.

County-level geographic identifiers were also provided to MPE by HCFA under special confidentiality arrangements. Being able to identify all NMCUES respondents by county of residence allowed the MPE team 1) to merge variables on the supply of medical providers from the 1983 Area Resources File to individual person records, and 2) to link state-by-state variations in Medicaid program characteristics (e.g., cost-sharing provisions) to their respective recipients.

The raw data files described above and augmented by their associated supply and program characteristics variables were processed at Syracuse University to create special-purpose files for MPE eligibility and cost-sharing analyses. Every MPE analysis sample was selected according to the following criteria:

1) full-year respondents only;
2) survey response status not imputed;
3) full-year survey eligibles only;
4) respondents from Arizona were excluded, as Arizona had no Medicaid program in 1980.

Observations from the various visit-level files--medical visit, hospital stay, dental visit, and prescribed medicines and other expenses--were selected by the same criteria and visit records which were entirely imputed were also excluded before visit records were aggregated to person-level totals.

Variables to denote family structure and pregnancy were not directly available from the survey but were created by manipulation of data from person, family, and visit-level files. Family structure designations were important in selecting an appropriate sample for MPE eligibility analysis; pregnancy status was used as an additional health status control in eligibility and cost-sharing estimation. These internally-created variables became part of final analysis files along with the supply and program characteristics data mentioned above and with variables specified directly from NMCUES response data.

Because NMCUES presented health insurance coverage and health services utilization data by their specific dates of change and occurrence, analysis files could be created based on shorter time spans than is usually possible with survey data. Health insurance data were converted to month-by-month coverage variables which measured the proportion of each month an HHS respondent was covered by each of several insurance types,

including Medicaid, Medicare, private insurance, and others. Separate variables were created to denote part-year Medicaid respondents' first month, second month, last month, and next to last month of Medicaid program participation. All monthly insurance status measures were then linked to monthly utilization totals for medical visits, dental visits, vision services, and drug purchases. The monthly insurance and utilization data were then merged to the individual characteristics of service users and non-users which were relatively invariant over time (e.g., sex, income, etc.) in order to create expanded analysis files comprising observations on respondents in each of the 12 months covered by the survey. Each monthly file for medical, hospital, prescription drug, dental, and vision services resulted in a sample size which afforded much greater estimation precision for the effects of Medicaid and other insurance on utilization behavior. In addition, this monthly approach allowed estimation of the effects on utilization of movement on and off the Medicaid program, a matter of prime importance for the MPE eligibility task.

In order to validate the monthly results with a comparative standard and to allow annual-level analysis when month-by-month changes were less relevant, each monthly service file was aggregated across the twelve months to create a perfectly consistent annualized version. Month-specific insurance variables in these files were replaced by health insurance variables which denoted full-year, part-year, or no coverage by the same set of insurance categories which appeared in the monthly files. Finally, a similarly and consistently constructed annualized file was

created by adding SMHS observations to the HHS sample. This analysis file was used primarily for MPE cost-sharing analysis and was therefore augmented by elaborate specifications of state-by-state coverage of Medicaid optional services and requirements for copayments on those services.

March Current Population Survey

The Current Population Survey (CPS) is a household sample survey conducted monthly by the Bureau of the Census for the Bureau of Labor Statistics, and it is the largest continuing intercensal survey of the U.S. population. It is the only source of monthly estimates of total employment and unemployment, occupation and industry of workers, number of workers classified by hours worked, earnings of workers, and, for those not in the labor force, past work experience and job search activities. The CPS is also a comprehensive source of information on the personal characteristics of the total population, including family structure and place of residence; demographic characteristics such as age, race, sex, and marital status; measures of health insurance coverage (both public and private); and participation in (and where applicable, income derived from) publicly financed transfer programs incuding, though not limited to, Medicaid, AFDC, SSI, and Medicare.

All CPS files are structured hierarchically, each household record being followed by a variable number of family records, which are in turn followed by a variable number of person records. This allows data analysis at the household, family, or person level, depending on which unit is deemed appropriate for a particular research interest.

The March CPS, also known as the Annual Demographic File, contains all the data elements described above, plus supplemental data on work experience, income, and migration. Data contained in an annual demographic file covers the calendar year prior to the survey. Thus the March 1980-1982 surveys used in the present study are inclusive of calendar years 1979-1982.

While sample sizes vary from year to year, the four March surveys used contain 73,195-80,468 household records, 64,593-70,871 family records, and 162,635-181,488 person records. Survey families and persons are given sample weights which allow estimates of characteristics of the total civilian nonstitutionalized population of the United States.

Half of the households (which in fact are addresses, not particular groups of persons) are sampled in two adjacent March CPS years, making the construction of two-year longitudinal files possible. While theoretically allowing for a 50 percent match rate, certain problems, notably migrations to and from households during the intervening year, limit the match rate to about 70 percent of the persons appearing in resampled households. The resulting two-year longitudinal files are approximately one third (.70 x .50) the size of either of the March CPS files used for the match. (For a complete description of the construction and use of matched CPS data files, see U.S. Department of Labor, Bureau of Labor Statistics, "Using the Current Population Survey as a Longitudinal Data Base", August 1980, Report 608). Three such two-year files were constructed, covering the periods 1979-1980, 1980-1981, and 1981-1982. Analysis of these files permits observations of changes experienced by the same persons across pairs of years.

APPENDIX B

Descriptive Measures and Probit Estimates from the NMCUES Analytic Samples

This appendix contains two types of statistical results. The first is descriptive information on the NMCUES analysis samples; these data are reported in Table B-1. The second is the detailed probit estimates for the various utilization equations; these results are reported in Tables B-2 through B-7.

Table B-1

Means and Proportions for the NMCUES Analysis Samples

Variables	Aggregate of Monthly Samples	Annual Samples: Full Year Insurance	Annual Samples: Part or Full Year Insurance
Dependent Variables			
Physician visits, one or more	.165	.686	.699
Hospital stays, one or more	.011	.104	.112
Prescription drug purchases, one or more	.109	.534	.540
Dental visits, one or more	.062	.373	.371
Eye examinations, one or more	.009	.088	.088
Eyeglasses purchases, one or more	.008	.092	.087
Independent Variables			
Medicaid coverage only	.302	.297	.319
Private coverage only	.390	.393	.334
Medicaid and private coverage	.069	.095	.163
First month on Medicaid	.004	----	----
Second month on Medicaid	.007	----	----
Last month on Medicaid	.004	----	----
Next to last month on Medicaid	.006	----	----
"Good" health	.402	.398	.401
"Fair" health	.102	.099	.104
"Poor" health	.027	.028	.029

Table B-1 (cont.) - page 2

Variables	Aggregate of Monthly Samples	Annual Samples: Full Year Insurance	Annual Samples: Part or Full Year Insurance
Health limits activity	.067	.069	.073
Pregnant	.043	.037	.040
Age less than 1 year, either sex	.033	.028	.031
Age 1 to 5 years, either sex	.150	.140	.146
Age 6 to 11 years, either sex	.175	.190	.184
Male, age 12 to 17 years	.081	.081	.085
Male, age 18 to 44 years	.136	.129	.124
Male, age 45 to 64 years	.025	.029	.026
Female, age 12 to 17 years	.097	.099	.103
Female, age 45 to 64 years	.058	.062	.059
Hispanic origin, any race	.119	.124	.124
Black, nonhispanic	.242	.254	.257
Married	.256	.247	.237
Family size	4.39	4.40	4.45
Education: 9 to 12 years	.647	.641	.649
Education: some college	.149	.145	.144
Nonmetropolitan residence	.321	.318	.309
Southern residence	.336	.337	.317
North central residence	.253	.241	.247

Table B-1 (cont.) - page 3

Variables	Aggregate of Monthly Samples	Annual Samples: Full Year Insurance	Annual Samples: Part or Full Year Insurance
Western residence	.215	.209	.223
Full time worker, part or full year	.226	.215	.210
Full time worker, Medicaid coverage only	.018	.012	.019
Full time worker, Medicaid and private coverage	.012	.016	.031
Patient care MDs per 10,000 population, 1980	15.45	15.61	15.84
Short term community hospital beds per 1,000 population, 1980	4.75	4.80	4.79
Pharmacies per 10,000 population, 1977	2.23	2.25	2.22
Patient care dentists per 10,000 population, 1980	4.95	4.85	4.87
Extent of fluoridation	.448	.447	.453
Patient care optometrists, 1978, and ophthamologists, 1979, per 10,000 population	1.34	1.37	1.38
Sample size[a]	28,203	1,734	2,038

Table B-1 (cont.) - page 4

[a] These sample sizes pertain to the analysis samples for physician visits, hospital stays, and prescription drug purchases. The measures related to dental services are based on sample sizes of 15,308; 1,416; and 1,662. Those related to eye examinations are based on sample sizes of 24,936; 1,469; and 1,744. Those related to eyeglasses purchases are based on sample sizes of 22,819; 1,344; and 1,594.

SOURCE: Authors' tabulations of data from the Household Survey component of the 1980 National Medical Care Utilization and Expenditure Survey, supplemented by data from the 1984 Area Resources File.

Table B-2

Probit Estimates of Physician Utilization Equations for Persons with Medicaid, Private Health Insurance, and No Insurance

	Probability of one or more physician visits		
		Per year	
Independent variables	Per month	Full year insurance	Part or full year insurance
	Probit estimates (absolute-valued t-statistics in parentheses)		
Constant	-1.189 (5.75)	0.698 (3.41)	0.735 (3.79)
Medicaid coverage only	0.333 (3.34)	0.521 (5.02)	0.492 (5.04)
Private coverage only	0.249 (2.78)	0.359 (4.01)	0.376 (4.22)
Medicaid and private coverage	0.197 (1.22)	0.293 (2.08)	0.453 (3.85)
First month on Medicaid	0.243 (0.57)	-----	-----
Second month on Medicaid	0.198 (0.55)	-----	-----
Last month on Medicaid	0.380 (0.79)	-----	-----
Next to last month on Medicaid	0.297 (0.73)	-----	-----
"Good" health	0.085 (1.19)	0.077 (1.08)	-0.028 (0.42)
"Fair" health	0.410 (3.76)	0.321 (2.50)	0.299 (2.51)
"Poor" health	0.713 (3.71)	0.367 (1.52)	0.450 (1.98)
Health limits activity	0.340 (2.75)	0.330 (2.15)	0.294 (2.11)
Pregnant	0.653 (4.46)	0.998 (3.73)	1.097 (4.25)
Age less than 1 year, either sex	0.621 (3.55)	0.983 (3.22)	0.768 (3.08)
Age 1 to 5 years, either sex	0.067 (0.55)	0.222 (1.66)	0.170 (1.38)
Age 6 to 11 years, either sex	-0.161 (1.31)	-0.120 (0.99)	-0.131 (1.14)
Male, age 12 to 17 years	-0.174 (1.17)	-0.106 (0.72)	-0.248 (1.86)
Male, age 18 to 44 years	-0.284 (2.18)	-0.373 (3.01)	-0.352 (3.02)
Male, age 45 to 64 years	-0.225 (0.97)	-0.417 (1.97)	-0.380 (1.84)

Table B-2 (cont.)

	Probability of one or more physician visits		
		Per year	
Independent variables	Per month	Full year insurance	Part or full year insurance
	Probit estimates (absolute-valued t-statistics in parentheses)		
Female, age 12 to 17 years	-0.028 (0.23)	-0.043 (0.31)	-0.077 (0.59)
Female, age 45 to 64 years	0.102 (0.71)	-0.320 (2.14)	-0.306 (2.15)
Hispanic origin, any race	-0.089 (0.80)	-0.180 (1.59)	-0.109 (1.04)
Black, nonhispanic	-0.110 (1.24)	-0.233 (2.64)	-0.200 (2.46)
Married	-0.024 (0.23)	-0.019 (0.18)	-0.057 (0.57)
Family size	-0.030 (1.50)	-0.098 (4.88)	-0.108 (5.80)
Education: 9 to 12 years	0.097 (1.04)	0.041 (0.46)	0.050 (0.59)
Education: some college	0.161 (1.33)	0.205 (1.60)	0.141 (1.19)
Nonmetropolitan residence	0.024 (0.32)	0.059 (0.71)	0.111 (1.41)
Southern residence	-0.135 (1.37)	-0.211 (2.11)	-0.185 (1.96)
North Central residence	-0.055 (0.60)	-0.060 (0.57)	-0.030 (0.31)
Western residence	-0.057 (0.54)	-0.217 (2.01)	-0.192 (1.96)
Full time worker, part or full year	0.028 (0.21)	0.001 (0.001)	-0.039 (0.35)
Full time worker, Medicaid coverage only	0.129 (0.59)	0.090 (0.26)	0.268 (1.01)
Full time worker, Medicaid and private coverage	0.252 (0.63)	0.251 (0.84)	0.405 (1.80)
Patient care MDs per 10,000 population, 1980	-0.001 (0.28)	0.001 (0.24)	0.003 (0.76)
n	28,203	1,734	2,038

SOURCE: Authors' estimates based upon data from the 1980 National Medical Care Utilization and Expenditure Survey.

Table B-3

Probit Estimates of Hospital Utilization Equations for Persons with Medicaid, Private Health Insurance, and No Insurance

	Probability of one or more hospital admissions		
		Per year	
Independent variables	Per month	Full year insurance	Part or full year insurance
	Probit estimates (absolute-valued *t*-statistics in parentheses)		
Constant	-2.861	-2.132 (6.91)	-2.069 (7.16)
Medicaid coverage only	0.465	0.749 (4.54)	0.789 (4.92)
Private coverage only	0.389	0.518 (3.43)	0.519 (3.44)
Medicaid and private coverage	0.137	0.309 (1.31)	0.484 (2.59)
First month on Medicaid	0.674	-----	-----
Second month on Medicaid	0.184	-----	-----
Last month on Medicaid	0.326	-----	-----
Next to last month on Medicaid	0.357	-----	-----
"Good" health	0.075	0.177 (1.71)	0.128 (1.35)
"Fair" health	0.341	0.518 (3.40)	0.516 (3.85)
"Poor" health	0.408	0.314 (1.19)	0.353 (1.53)
Health limits activity	0.336	0.660 (4.08)	0.655 (4.63)
Pregnant	0.973	1.852 (9.43)	1.882 (10.76)
Age less than 1 year, either sex	0.559	0.734 (2.95)	0.787 (3.68)
Age 1 to 5 years, either sex	0.124	0.134 (0.77)	0.194 (1.27)
Age 6 to 11 years, either sex	-0.089	-0.059 (0.34)	-0.126 (0.79)
Male, age 12 to 17 years	-0.249	-0.507 (2.06)	-0.457 (2.13)
Male, age 18 to 44 years	-0.051	-0.016 (0.09)	-0.020 (0.13)
Male, age 45 to 64 years	-0.033	-0.216 (0.75)	-0.225 (0.82)

Table B-3 (cont.)

	Probability of one or more hospital admissions		
		Per year	
Independent variables	Per month	Full year insurance	Part or full year insurance
		Probit estimates (absolute-valued t-statistics in parentheses)	
Female, age 12 to 17 years	-0.092	-0.094 (0.47)	-0.153 (0.86)
Female, age 45 to 64 years	0.051	-0.071 (0.35)	-0.081 (0.43)
Hispanic origin, any race	-0.109	-0.083 (0.49)	-0.073 (0.48)
Black, nonhispanic	-0.040	0.113 (0.94)	0.031 (0.28)
Married	0.042	0.101 (0.72)	0.077 (0.59)
Family size	-0.007	-0.013 (0.44)	-0.026 (0.97)
Education: 9 to 12 years	-0.050	-0.038 (0.29)	0.017 (0.14)
Education: some college	-0.042	0.042 (0.24)	0.009 (0.06)
Nonmetropolitan residence	0.027	0.239 (2.09)	0.190 (1.81)
Southern residence	-0.067	-0.193 (1.39)	-0.194 (1.52)
North Central residence	-0.026	-0.021 (0.15)	-0.001 (0.01)
Western residence	-0.146	-0.319 (2.04)	-0.276 (2.00)
Full time worker, part or full year	0.150	0.248 (1.56)	0.258 (1.68)
Full time worker, Medicaid coverage only	-0.091	-0.753 (1.53)	-0.530 (1.60)
Full time worker, Medicaid and private coverage	0.287	0.495 (1.32)	0.153 (0.56)
Patient care MDs per 10,000 population, 1980	-0.003	0.003 (0.45)	-0.003 (0.54)
Short term community hospital beds per 1,000 population, 1980	0.020	0.001 (0.04)	0.022 (0.97)
n	28,203	1,734	2,038

SOURCE: Authors' estimates based upon data from the 1980 National Medical Care Utilization and Expenditure Survey.

Table B-4

Probit Estimates of Prescription Drug Utilization Equations for Persons with Medicaid, Private Health Insurance, and No Insurance

	Probability of one or more prescriptions		
		Per year	
Independent variables	Per month	Full year insurance	Part or full year insurance
	Probit estimates (absolute-valued *t*-statistics in parentheses)		
Constant	-1.222 (4.73)	0.209 (0.95)	0.233 (1.12)
Medicaid coverage only	0.283 (2.47)	0.499 (4.93)	0.482 (5.01)
Private coverage only	0.271 (2.76)	0.427 (4.80)	0.441 (4.99)
Medicaid and private coverage	0.247 (1.32)	0.329 (2.36)	0.394 (3.45)
First month on Medicaid	0.104 (0.25)	-----	-----
Second month on Medicaid	-0.167 (0.28)	-----	-----
Last month on Medicaid	0.102 (0.29)	-----	-----
Next to last month on Medicaid	0.123 (0.34)	-----	-----
"Good" health	0.122 (1.49)	0.216 (3.11)	0.149 (2.32)
"Fair" health	0.490 (4.13)	0.839 (6.57)	0.786 (6.80)
"Poor" health	0.717 (3.52)	0.812 (3.43)	0.820 (3.79)
Health limits activity	0.287 (2.16)	0.208 (1.46)	0.210 (1.64)
Pregnant	0.208 (1.23)	0.524 (2.69)	0.667 (3.75)
Age less than 1 year, either sex	0.318 (1.63)	0.849 (3.57)	0.751 (3.65)
Age 1 to 5 years, either sex	-0.033 (0.24)	0.281 (2.25)	0.168 (1.46)
Age 6 to 11 years, either sex	-0.286 (2.05)	-0.142 (1.21)	-0.176 (1.60)
Male, age 12 to 17 years	-0.383 (2.13)	-0.298 (2.08)	-0.414 (3.16)
Male, age 18 to 44 years	-0.371 (2.60)	-0.369 (3.03)	-0.357 (3.15)
Male, age 45 to 64 years	-0.136 (0.58)	-0.207 (0.98)	-0.183 (0.89)

Table B-4 (cont.)

	Probability of one or more prescriptions		
		Per year	
Independent variables	Per month	Full year insurance	Part or full year insurance
	Probit estimates (absolute-valued *t*-statistics in parentheses)		
Female, age 12 to 17 years	-0.258	-0.204	-0.239
	(1.58)	(1.50)	(1.93)
Female, age 45 to 64 years	0.188	0.116	0.093
	(1.31)	(0.77)	(0.66)
Hispanic origin, any race	-0.112	-0.142	-0.026
	(0.87)	(1.28)	(0.26)
Black, nonhispanic	-0.193	-0.292	-0.316
	(1.84)	(3.40)	(4.01)
Married	-0.045	-0.001	-0.056
	(0.37)	(0.01)	(0.58)
Family size	-0.061	-0.100	-0.106
	(2.49)	(5.01)	(5.79)
Education: 9 to 12 years	0.133	0.182	0.199
	(1.24)	(2.05)	(2.40)
Education: some college	0.221	0.341	0.342
	(1.58)	(2.77)	(3.03)
Nonmetropolitan residence	0.030	-0.012	0.028
	(0.27)	(0.15)	(0.37)
Southern residence	0.017	-0.065	-0.020
	(0.19)	(0.67)	(0.22)
North Central residence	-0.014	-0.004	-0.006
	(0.13)	(0.04)	(0.06)
Western residence	-0.091	-0.177	-0.211
	(0.69)	(1.67)	(2.20)
Full time worker, part or full year	0.022	0.038	-0.001
	(0.16)	(0.34)	(0.01)
Full time worker, Medicaid coverage only	0.165	0.116	-0.216
	(0.67)	(0.36)	(0.91)
Full time worker, Medicaid and private coverage	0.262	0.245	0.355
	(0.69)	(0.85)	(1.70)
Patient care MDs per 10,000 population, 1980	-0.004	-0.006	-0.005
	(0.79)	(1.45)	(1.30)
Drug stores per 10,000 population, 1977	-0.017	-0.052	-0.043
	(0.37)	(1.23)	(1.08)
n	28,203	1,734	2,038

SOURCE: Authors' estimates based upon data from the 1980 National Medical Care Utilization and Expenditure Survey.

Table B-5

Probit Estimates of Dental Service Utilization Equations for Persons with Medicaid, Private Health Insurance, and No Insurance

	Probability of one or more dentist visits		
		Per year	
Independent variables	Per month	Full year insurance	Part or full year insurance
	Probit estimates (absolute-valued *t*-statistics in parentheses)		
Constant	-1.643	0.048	0.051
	(4.01)	(0.22)	(0.24)
Medicaid coverage only	0.417	0.339	0.296
	(2.23)	(3.63)	(3.46)
Private coverage only	0.546	0.372	0.365
	(2.85)	(3.57)	(3.52)
Medicaid and private coverage	0.638	0.654	0.547
	(2.02)	(3.07)	(3.45)
First month on Medicaid	-0.096	-----	-----
	(0.49)		
Second month on Medicaid	-0.312	-----	-----
	(0.03)		
Last month on Medicaid	-0.073	-----	-----
	(0.24)		
Next to last month on Medicaid	-0.169	-----	-----
	(0.12)		
"Good" health	0.008	-0.163	-0.181
	(0.06)	(2.14)	(2.58)
"Fair" health	-0.035	-0.160	-0.168
	(0.16)	(1.15)	(1.35)
"Poor" health	-0.315	-0.493	-0.340
	(0.52)	(1.63)	(1.39)
Health limits activity	0.108	0.056	0.041
	(0.43)	(0.33)	(0.28)
Pregnant	-.040	0.097	-0.031
	(0.14)	(0.51)	(0.18)
Age 1 to 5 years, either sex[a]	-0.355	-0.409	-0.387
	(1.45)	(2.96)	(3.08)
Age 6 to 11 years, either sex	-0.021	-0.009	0.002
	(0.13)	(0.07)	(0.02)
Male, age 12 to 17 years	0.069	0.113	0.134
	(0.35)	(0.73)	(0.96)
Male, age 18 to 44 years	-0.077	-0.136	-0.165
	(0.31)	(1.03)	(1.35)
Male, age 45 to 64 years	0.129	0.188	0.088
	(0.39)	(0.77)	(0.37)

Table B-5 (cont.)

Independent variables	Probability of one or more dentist visits		
		Per year	
	Per month	Full year insurance	Part or full year insurance
	Probit estimates (absolute-valued t-statistics in parentheses)		
Female, age 12 to 17 years	-0.006 (0.01)	0.052 (0.34)	0.089 (0.64)
Female, age 45 to 64 years	-0.093 (0.25)	-0.134 (0.81)	-0.180 (1.16)
Hispanic origin, any race	-0.135 (0.62)	-0.495 (4.11)	-0.484 (4.44)
Black, nonhispanic	-0.229 (1.29)	-0.476 (4.66)	-0.512 (5.55)
Married	0.004 (0.04)	-0.186 (1.66)	-0.144 (1.38)
Family size	-0.045 (1.45)	-0.048 (2.26)	-0.052 (2.67)
Education: 9 to 12 years	-0.031 (0.27)	-0.127 (1.20)	-0.115 (1.18)
Education: some college	-0.017 (0.17)	0.141 (1.06)	0.088 (0.72)
Nonmetropolitan residence	0.069 (0.45)	0.144 (1.64)	0.104 (1.28)
Full time worker, part or full year	-0.108 (0.48)	-0.068 (0.56)	-0.053 (0.45)
Full time worker, Medicaid coverage only	0.054 (0.17)	0.001 (0.003)	-0.140 (0.69)
Full time worker, Medicaid and private coverage	-0.073 (0.04)	-0.512 (1.06)	-0.344 (1.11)
Patient care dentists per 10,000 population, 1980	0.016 (0.37)	0.017 (0.77)	0.021 (1.02)
Percent fluoridation	-0.001 (0.66)	-0.001 (0.85)	-0.001 (0.66)
n	15,308	1,416	1,662

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[a] Children under 1 year of age were excluded from the dental use sample.

SOURCE: Authors' estimates based upon data from the 1980 National Medical Care Utilization and Expenditure Survey.

Table B-6

Probit Estimates of Eye Exam Utilization Equations for Persons with Medicaid and No Insurance[a]

	Probability of one or more eye exam visits		
		Per year	
Independent variables	Per month	Full year insurance	Part or full year insurance
	Probit estimates (absolute-valued *t*-statistics in parentheses)		
Constant	-2.095	-0.622 (2.12)	-0.655 (2.40)
Medicaid coverage only	0.142	0.082 (0.66)	0.095 (0.84)
First month on Medicaid	0.209	-----	-----
Second month on Medicaid	0.040	-----	-----
Last month on Medicaid	0.056	-----	-----
Next to last month on Medicaid	-2.510	-----	-----
"Good" health	-0.077	0.003 (0.03)	-0.090 (0.89)
"Fair" health	-0.052	0.064 (0.36)	-0.043 (0.26)
"Poor" health	0.227	0.490 (1.78)	0.345 (1.40)
Health limits activity	-0.130	-0.090 (0.42)	-0.127 (0.67)
Pregnant	-0.242	-0.305 (1.10)	-0.336 (1.34)
Age less than 1 year, either sex	-2.590	-3.342 (0.38)	-3.380 (0.44)
Age 1 to 5 years, either sex	-0.497	-0.710 (3.22)	-0.685 (3.50)
Age 6 to 11 years, either sex	-0.084	-0.159 (0.93)	-0.183 (1.15)
Male, age 12 to 17 years	0.025	-0.053 (0.27)	0.024 (0.14)
Male, age 18 to 44 years	-0.174	-0.550 (2.59)	-0.420 (2.30)
Male, age 45 to 64 years	0.133	0.134 (0.46)	0.179 (0.63)

Table B-6 (cont.)

	Probability of one or more eye exam visits		
		Per year	
Independent variables	Per month	Full year insurance	Part or full year insurance
	Probit estimates (absolute-valued t-statistics in parentheses)		
Female, age 12 to 17 years	0.028	-0.003 (0.02)	-0.026 (0.14)
Female, age 45 to 64 years	0.014	0.005 (0.03)	0.026 (0.14)
Hispanic origin, any race	-0.340	-0.651 (2.84)	-0.750 (3.46)
Black, nonhispanic	-0.098	-0.089 (0.68)	-0.174 (1.45)
Married	0.056	-0.038 (0.25)	-0.024 (0.17)
Family size	-0.064	-0.105 (3.12)	-0.094 (3.11)
Education: 9 to 12 years	0.098	-0.072 (0.49)	0.024 (0.17)
Education: some college	0.200	0.090 (0.48)	0.142 (0.81)
Nonmetropolitan residence	0.019	0.067 (0.55)	0.039 (0.35)
Southern residence	-0.076	-0.132 (0.84)	-0.140 (0.94)
North Central residence	0.085	0.008 (0.06)	0.014 (0.11)
Western residence	0.027	-0.015 (0.09)	-0.054 (0.39)
Full time worker, part or full year	-0.097	-0.170 (0.98)	-0.203 (1.21)
Full time worker, Medicaid coverage only	0.044	0.244 (0.78)	0.373 (1.58)
Patient care optometrists, 1978, and ophthamologists, 1979, per 10,000 population	-0.037	-0.004 (0.04)	-0.013 (0.15)
n	24,936	1,469	1,744

[a] The NMCUES survey did not inquire about private insurance coverage of vision care.

SOURCE: Authors' estimates based upon data from the 1980 National Medical Care Utilization and Expenditure Survey.

Table B-7

Probit Estimates of Eyeglasses Utilization Equations for Persons with Medicaid and No Insurance[a]

	Probability of one or more eyeglasses purchases		
		Per year	
Independent variables	Per month	Full year insurance	Part or full year insurance
	Probit estimates (absolute-valued t-statistics in parentheses)		
Constant	-2.264	-0.865 (2.71)	-0.896 (2.96)
Medicaid coverage only	0.027	-0.093 (0.68)	-0.149 (1.18)
First month on Medicaid	-0.017	-----	-----
Second month on Medicaid	0.266	-----	-----
Last month on Medicaid	0.358	-----	-----
Next to last month on Medicaid	-2.537	-----	-----
"Good" health	-0.040	0.069 (0.58)	0.009 (0.08)
"Fair" health	0.034	0.217 (1.17)	0.187 (1.11)
"Poor" health	0.060	0.472 (1.59)	0.364 (1.36)
Health limits activity	0.092	-0.056 (0.24)	0.049 (0.24)
Pregnant	-0.063	0.079 (0.32)	-0.061 (0.26)
Age less than 1 year, either sex	-2.612	-3.288 (0.38)	-3.268 (0.42)
Age 1 to 5 years, either sex	-1.218	-1.398 (3.45)	-1.447 (3.64)
Age 6 to 11 years, either sex	-0.173	-0.154 (0.84)	-0.155 (0.89)
Male, age 12 to 17 years	0.037	0.078 (0.37)	0.128 (0.66)
Male, age 18 to 44 years	-0.203	-0.444 (2.23)	-0.454 (2.48)
Male, age 45 to 64 years	0.340	0.186 (0.61)	0.175 (0.59)

Table B-7 (cont.)

	Probability of one or more eyeglasses purchases		
		Per year	
Independent variables	Per month	Full year insurance	Part or full year insurance
	Probit estimates (absolute-valued t-statistics in parentheses)		
Female, age 12 to 17 years	-0.012	0.033 (0.16)	0.073 (0.39)
Female, age 45 to 64 years	0.040	0.113 (0.57)	0.117 (0.62)
Hispanic origin, any race	-0.117	-0.507 (2.19)	-0.559 (2.52)
Black, nonhispanic	-0.132	-0.070 (0.49)	-0.139 (1.05)
Married	0.009	0.101 (0.65)	0.107 (0.73)
Family size	-0.050	-0.085 (2.27)	-0.077 (2.25)
Education: 9 to 12 years	0.184	0.013 (0.08)	0.095 (0.61)
Education: some college	0.375	0.411 (2.06)	0.441 (2.33)
Nonmetropolitan residence	0.038	0.018 (0.14)	-0.007 (0.06)
Southern residence	-0.067	-0.123 (0.72)	-0.128 (0.78)
North Central residence	0.125	0.106 (0.70)	0.118 (0.83)
Western residence	-0.129	-0.147 (0.85)	-0.197 (1.22)
Full time worker, part or full year	-0.064	-0.036 (0.21)	-0.014 (0.08)
Full time worker, Medicaid coverage only	0.265	0.252 (0.80)	0.423 (1.77)
Patient care optometrists, 1978, and ophthamologists, 1979, per 10,000 population	0.018	-0.013 (0.14)	-0.024 (0.27)
n	22,819	1,344	1,594

[a] The NMCUES survey did not inquire about private insurance coverage of vision care.

SOURCE: Authors' estimates based upon data from the 1980 National Medical Care Utilization and Expenditure Survey.

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